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COMMERCIAL FISHERIES REVIEW

A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

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CONTENTS

COVER: A sponge boat bringing in its catch to Tarpon Springs, Fla. Other boats of the sponge fleet in the background. Sponge harvesting techniques were brought to the United States more than a hundred years ago by Greek sponge fishermen. The demand for natural sponges continues because man may imitate but has never duplicated the natural sponge. (See p. 34 of this issue.)

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Contents continued page III.

CONTENTS (CONTINUED)

THE ACTIVITY AND CATCHABILITY OF THE LOBSTER

Drs. Don McLeese and Dick Wilder of the Fisheries Research Board's St. Andrews Station have been studying activity and catchability of lobsters. Their report appears in the Station's anniversary number (Volume 15, Number 6) of the Journal of the Fisheries Research Board. Activity was measured by the speed with which a lobster retreats when a bright light is turned on it.

When lobsters are accustomed to water of a certain temperature, their walking rate increases with water temperatures from 36° to 50°F and again from 68° to 77°F but there is little change between 50° and 68°F. Lobsters used to colder water became more active when temperature increased but those used to higher temperatures slowed down when moved to either cooler or warmer water.

Fishing experiments in Passamaquoddy Bay showed how much catches fall off as water temperatures go down in the fall. The change in catches fits in well with the decline in activity as shown in the laboratory experiment. The relationship between activity and catchability helps in the interpretation of catch per unit of effort data. It also explains the improvement in fishing as waters warm in the spring. (Bulletin, Fisheries Council of Canada - May 25, 1959.)

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COMMERCIAL FISHERIES REVIEW

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SHRIMP EXPLORATION IN CENTRAL ALASKAN WATERS BY THE M/V JOHN N. COBB, OCTOBER-NOVEMBER 1959

By Fred Wathne* and Harold C. Johnson*

SUMMARY

To assess the commercial potential of the shrimp populations of central Alaska during the fall season, the U. S. Bureau of Commercial Fisheries research vessel John N. Cobb conducted exploratory fishing operations in that area from October 14 to November 13, 1959. During the cruise, 101 shrimp-trawl drags were made using a 40/43-foot Gulf of Mexico-type shrimp trawl.

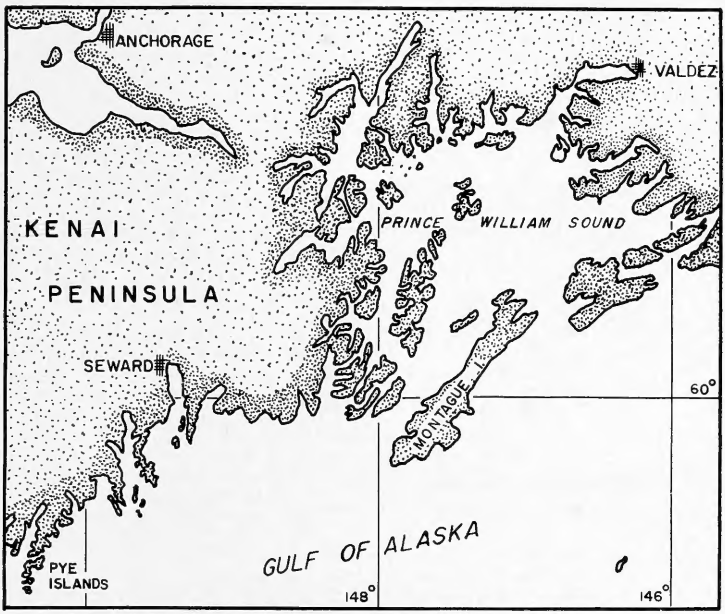

Fig. 1 - Central Alaska. The general area explored by the John N. Cobb, during shrimp investigations--October-November 1959.

Shrimp catches were poor throughout the area investigated. A commercial potential was uncovered only in a few drags--west of Seal Rocks, along the western shore of the outer portion of Day Harbor, and outside Whidbey Bay--where catch rates of from 550 to 660 pounds of heads-on shrimp per hour were achieved.

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Pink shrimp (Pandalus borealis), sidestripe shrimp (Pandalopsis dispar), and coonstripe shrimp (Pandalus hypsinotus) were found in quantity. Spot shrimp (Pandalus platyceros) and gray shrimp (Crangon sp.) were taken frequently, but in very small quantities.

INTRODUCTION

Exploratory shrimp fishing was conducted by the U. S. Bureau of Commercial Fisheries research vessel John N. Cobb in the central Alaska region, from the Pye Islands to and including Prince William Sound, from October 14 to November 13, 1959 (fig. 1). The exploration was the eleventh Bureau investigation conducted since 1950 to evaluate the potential of the shrimp resources in Alaskan waters.

Objectives of the cruise were to: (1) determine the species and abundance of shrimp available in this area during October and November; (2) determine bottom conditions and assess current and tidal characteristics, which could affect fishing operations; and (3) collect oceanographic data, which could be helpful in understanding shrimp distribution as related to the environment.

The work was carried out in cooperation with biologists of the Alaska Department of Fish and Game and members of the industry in the area.

BACKGROUND

Results of shrimp explorations in Alaska by the Bureau prior to 1950, and by individuals and agencies outside the Bureau, have been summarized by Schaefers and Smith (1954) and Greenwood (1959). Between 1950 and the fall of 1959, the Bureau conducted 10 shrimp explorations in Alaskan waters: 5 in southeastern Alaska; 1 in Yakutat Bay; 2 in Prince William Sound; 1 in the Shumagin Islands area; and 1 in Cook Inlet-Kodiak Island region.[1/] These explorations have revealed numerous areas of commercial shrimp potential; and, in both the lower Cook Inlet and Kodiak Island areas, commercial trawling for shrimp has developed subsequent to the Bureau's exploratory work.

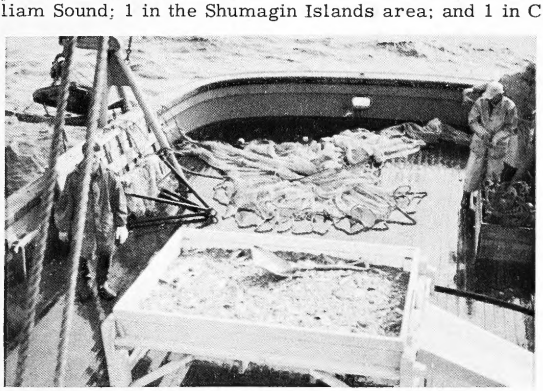

Fig. 2 - A typical catch made on Cruise 44 of the John N. Cobb. The trawl in the background is rigged with a "loop chain."

GEAR

All exploratory drags during this cruise were made with a 40/43-foot, Gulf-of-Mexico-type shrimp trawl, similar to that described by Schaefers and Johnson (1957). The net was rigged with: a tickler chain, 10 inches shorter than the total footrope-and-extension-strap distance; a loop chain (fig. 2) consisting of 15 inches of $\frac{1}{4}$-inch chain secured at 12-inch intervals along the footrope; or with no chain. No difference in catch rates was noted with differences in rigging. The doors used measured $2\frac{1}{2}$ feet by 5 feet and weighed 160 pounds each. The trawl was dragged using a single $\frac{1}{2}$-inch-diameter warp and a 25-fathom bridle. The approximate scope ratios (ratios of warp to water depth) employed, varied from 3:1 for the deep drags to 5:1 for the shallower drags. Trawling speed varied between $2\frac{1}{2}$ and 3 knots. Drags were of 30-minute duration.

1/ For results of those surveys see: Schaefers 1951, 1953; Ellson and Livingstone, 1952; Schaefers and Smith, 1954; Schaefers, Smith, and Greenwood, 1955; Greenwood 1958, 1959; and Johnson 1959.

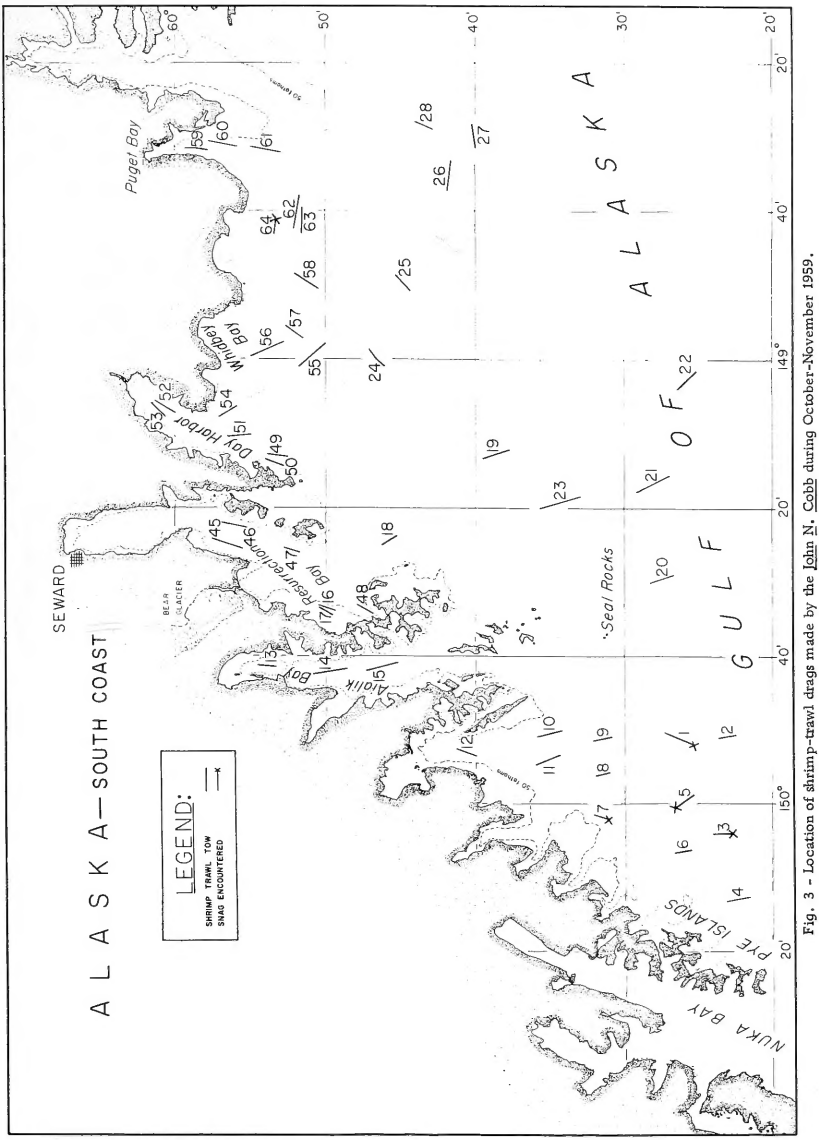

Fig. 3 - Location of shrimp-trawl drags made by the John N. Cobb during October-November 1959.

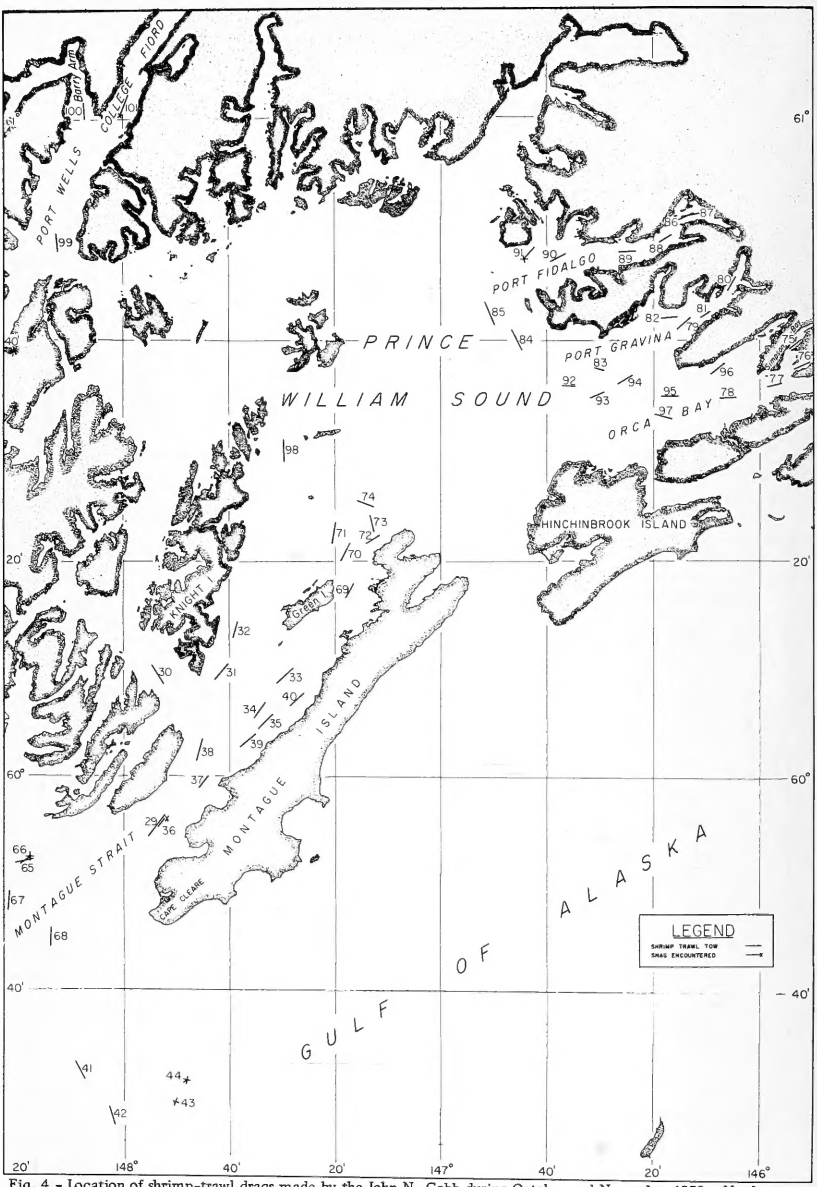

Fig. 4 - Location of shrimp-trawl drags made by the John N. Cobb during October and November 1959. Northeastern portion of the cruise.

FISHING RESULTS

During the explorations, 101 drags were made in depths ranging from 20 to 233 fathoms (figs. 3 and 4).

Pink shrimp (Pandalus borealis), sidestripe shrimp (Pandalopsis dispar), and coonstripe shrimp (Pandalus hypsinotus) were found in significant quantities. Spot shrimp (Pandalus platyceros) and gray shrimp (Crangon sp.) were taken frequently but in very small quantities. Egg-bearing females constituted a high percentage of pink shrimp found throughout the area explored. In many catches, the percentage of egg bearers ranged as high as 90 percent and it was at least 50 percent in most cases.

Shrimp catches were poor throughout the area. A commercial potential was uncovered only in a few drags west of Seal Rocks, along the outer portion of the western shore of Day Harbor, and outside Whidbey Bay, where catch rates of from 550 to 660 pounds of whole shrimp were achieved.[2/]

PYE ISLANDS TO SEAL ROCKS: Eleven drags made here in depths ranging from 74 to 115 fathoms, took shrimp at rates ranging from 20 to 600 pounds per hour. Only three of these drags (drag numbers 8, 9, and 11) produced shrimp at rates greater than 400 pounds per hour. In the catches, 74 to 80 percent of the shrimp were pinks, averaging 87 to 119 count (number of whole heads-on shrimp in a pound). The balance were sidestripes ranging from 31 to 34 count. The remaining nine drags produced shrimp at rates lower than 150 pounds per hour. The catches in this area were "trashy[1/]" with shrimp constituting only 5 to 55 percent of the total weight of the catches.

Considering the design and size of the trawl, significant quantities of marketable food fish were taken in two drags in this area. Drag number 2, in 90 to 102 fathoms, took Pacific ocean perch (Sebastodes alutus) at the rate of 1,200 pounds per hour and true cod (Gadus macrocephalus) at a rate of 280 pounds per hour. Drag number 9 in 100 to 104 fathoms produced true cod at a rate of 200 pounds per hour.

Dragging bottom in this area is generally good at depths greater than 80 fathoms and poor in shallower depths.

AIALIK BAY: Three drags, in depths from 94 to 158 fathoms, produced shrimp at rates from 120 to 375 pounds per hour. These shrimp catches were made up of from 63 to 83 percent sidestripe shrimp, which averaged 30 to 63 count in individual drags, and 17 to 37 percent pink shrimp which averaged 104 to 165 count in individual drags. Drag number 13 was comparatively clean (89-percent shrimp), whereas drags 14 and 15 contained only 33 and 37 percent shrimp, respectively. Trawling bottom is good the entire length of the bay in areas deeper than 50 fathoms.

RESURRECTION BAY: Four drags here produced shrimp at rates ranging from 60 to 200 pounds per hour. Two of these drags (numbers 45 and 47) in depths from 120 to 146 fathoms, produced predominantly sidestripe shrimp. The catch of drag number 45 contained 72 percent sidestripe shrimp averaging 68 count and that of drag number 47 contained 87 percent sidestripe shrimp averaging 29 count. The remaining catches produced predominantly pink shrimp. All catches were trashy, and shrimp constituted only 29 to 61 percent of the total weight.

Dragging bottom, in the areas worked, is good except on the shelf south of Bear Glacier in water shallower than 50 fathoms (drags 16 and 17).

DAY HARBOR: Drag number 49, in 68 to 84 fathoms, produced shrimp at the rate of 660 pounds per hour. Of these, 96 percent were pink shrimp averaging 100 count. Drag number 50, in 52 to 56 fathoms, produced shrimp at the rate of 550 pounds per hour. All of these were pink shrimp averaging 110 count. Both drags were relatively clean--shrimp constituted 96 and 86 percent of the totals (fig. 5). Four additional drags, in depths from 54 to 108

2/ All shrimp weights and counts are expressed in terms of whole heads-on shrimp.
3/ Trashy, as used here, indicates a high percentage by weight of noncommercial fish and invertebrates in the total catch.

fathoms, yielded shrimp at rates from 80 to 300 pounds per hour. The shallowest of these drags (drag 54) produced shrimp at the rate of 300 pounds per hour. All of these were pink shrimp averaging 98 count. This catch was also clean, being composed of 88-percent shrimp. The other 3 drags were moderately trashy.

Fig. 5 - A clean catch of 330 pounds of predominantly pink shrimp from a drag made in Day Harbor.

OFFSHORE, SOUTHWEST OF MONTAGUE ISLAND: Drag number 55, outside Whidbey Bay in 55 to 59 fathoms, took pink shrimp (104 count) at a rate of 660 pounds per hour. This was a clean catch composed of 89 percent shrimp. Another drag (drag 26) south of Puget Bay in 106 to 110 fathoms, caught shrimp at a rate of 400 pounds per hour. This catch, however, was trashy, and shrimp constituted only 29 percent of the total weight. The remaining successful drags in this area were made between 59 and 142 fathoms. The shrimp catches ranged from 30 to 220 pounds per hour and were composed primarily of pinks ranging in average size per drag from 62 to 140 count. The balance were sidestripe shrimp ranging in average size per drag from 22 to 64 count. Dragging bottom in this area is good in water deeper than 70 fathoms. Drags outside Puget Bay and southwest of Cape Cleare in depths shallower than 70 fathoms were hindered by a very strong westerly current, and attempts to fish here resulted in failure of the gear to reach bottom, twisted gear, or bogged doors. Off Whidbey Bay, in water shallower than 70 fathoms, the bottom is irregular and composed of rock in some locations; consequently only short drags were possible in a relatively narrow depth range.

MONTAGUE STRAIT AND GREEN ISLAND AREA: Nineteen drags were made here in depths ranging from 20 to 158 fathoms. The best shrimp catch (drag number 34) consisted 130 pounds (260 pounds per hour) of three species: 75 percent 108-count pink shrimp; 21 percent 20-count sidestripe shrimp; and 4 percent 8-count coonstripe shrimp. This catch was trashy, however, being composed of only 56 percent shrimp. The balance of the drags in this area produced very poor shrimp catches which ranged from only a trace to 160 pounds per hour. These catches were also trashy, with shrimp constituting only 7 to 38 percent by weight.

Fig. 6 - The catch from a drag made in Barry Army of Port Wells. One hundred pounds of pink and sidestripe shrimp were taken in this drag.

EASTERN PRINCE WILLIAM SOUND AREA: Twenty-three drags were made in this area in depths ranging from 32 to 233 fathoms. Shrimp catches were very poor. The largest catch was made in Simpson Bay in 32 to 45 fathoms where shrimp were taken at the rate of 540 pounds per hour (drag 75). The shrimp catch was composed of 78 percent pink shrimp averaging 112 count, 13 percent sidestripe shrimp averaging 39 count, and 9 percent coonstripe shrimp averaging 54 count. The catch, however, was trashy, and shrimp constituted only 53 percent of the total weight. The remainder of the drags in this area produced shrimp at rates ranging from 2 to 80 pounds per hour, and the catches were very trashy.

PORT WELLS AREA: One of three drags in this area (drag number 100) produced shrimp at an hourly rate of 200 pounds. The catch was composed of 37 percent pink shrimp (156 count), 51 percent sidestripe shrimp (25 count), and 12 percent coonstripe shrimp (18 count). The shrimp in this drag constituted only 44 percent of the total catch. In addition to the marine life, two large boulders weighing approximately 75 and 150 pounds were taken, indicating unsuitable bottom for extended drags (fig. 6). The drag in College Fiord (number 100) resulted in a severely damaged net and loss of the catch.

FISH CATCH

Catches of food fish obtained during the cruise ranged from 0 to 740 pounds per half-hour drag. The 740-pound catch was taken between Pye Islands and Seal Rocks (drag number 2) in 90 to 102 fathoms. In addition, 175 pounds of Pacific ocean perch were taken in each of two drags outside Whidbey Bay (drags number 24 and 26). Also, approximately 100 pounds of marketable-size rock sole (Lepidopsetta bilineata) were taken in drags near Green Island (drag 69) and in Orca Bay (drag number 77).

The majority of the catches, however, consisted predominantly of industrial species including: walleye pollock (Theragra chalcogrammus); turbot or arrowtooth flounder (Atheresthes stomias); yellowfin sole (Limanda aspera); flathead sole (Hippoglossoides elassodon); smelt (Osmeridae); sculpin (Cottidae): sea poacher (Agonidae); blenny (Xiphisteridae); eel pouts (Zoarcidae); herring (Clupea pallasi); skates (Raja sp.); and dogfish (Squalus acanthias).

MISCELLANEOUS OBSERVATIONS

Weather and oceanographic observations were recorded at each fishing station. Surface water temperatures were obtained at each station. They ranged from 37.7° F. to 49.7° F. and averaged 46.5° F. Bottom water temperatures were obtained at 44 stations. The range was 41.5° F. to 52° F. and averaged 44.7° F.

Bottom samples were obtained from all but two stations. In all but 5 instances the bottom consisted wholly or partially of gray mud. The color was a very light gray in contrast to the darker gray and greenish mud bottom found in the Cook Inlet-Kodiak Island area in 1958 (Greenwood 1959). On the other five drags the bottom types were gravel, rock, coral (or various combinations of these), and mud.

APPENDIX

A supplemental oceanographic observations table for Cruise 44 is available at the Seattle office of the Branch of Exploratory Fishing.

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CONSERVATION OF YOUNG EEL MIGRATION ROUTES INTO INLAND WATER SYSTEM OF THE NETHERLANDS

Due to the steady demands to keep the inland waters of the low-lying parts of the Netherlands as fresh as possible, more and more dams, locks, and sluices are built as a separation between the sea and the inland water system. Hence elvers or young eels encounter steadily-increasing difficulties in their efforts to reach the inland waters from the sea and at some places it is even virtually impossible for them to cross these barriers.

With the idea to preserve the most important migration routes, it was decided to investigate the possibility to facilitate the inward elver migration, especially at the Afsluitdijk, which bars the IJsselmeer from the sea. In this respect it may be stated that the most obvious solution of this problem--viz. construction of so-called elver ladders--is practically impossible, because such ladders would be too readily destroyed by heavy waves pounding on the dam during spells of bad weather.

In the first years following 1932--the year during which the Zuyder Sea was dammed off from the North Sea and was renamed IJsselmeer--it was decided to open the sluices in the Afsluitdijk in the elver season at the time the sea level was at the same height as that of the IJsselmeer. By this procedure elvers got sufficient opportunity to pass the sluices and subsequently to migrate into the lake. The great drawback was that considerable quantities of sea water entered the lake besides the elvers. For even when fresh water passed the sluices on the way to the sea, saline water crept into the Ijsselmeer along the bottom.

According as the salinity of the lake decreased, which was of considerable advantage to the agricultural areas around the IJsselmeer, this inward flow of sea water could no longer be allowed. Therefore a new procedure of elver passing was introduced in the year 1938, based on the results of several years of studying elver behavior.

The method adopted consisted of the alternate opening and closing of the two hatches of the sluices. First the seaward hatches were lifted, so that elvers were able to enter the sluices, to congregate there near the inner hatches. This worked especially well during the periods when fresh water leaked in along the sides of the inner hatches. Next the seaward hatches were closed and the inner ones opened. The elvers thereby got the opportunity to enter the fresh lake. After some time the inner hatches were closed again and the outer ones opened, and so on. In fact, the elvers were handled like a ship in a lock. This whole sequence was repeated six times per night in the entire elver seasons and up to 1957 inclusive it met with considerable success. The great drawback was, however, again that appreciable quantities of sea water flowed into the IJsselmeer: per season some 10,000,000 square meters.

In an effort to eliminate this drawback a renewed study on elver behavior was started. This revealed that elvers are quite willing to migrate against a fresh-water flow along the sea bottom, and do not do so exclusively in the surface layers as was hitherto presumed. Based upon this knowledge, a new procedure has been put in operation from 1958 onwards: during low tide in sea the hatches of the sluices will be raised a few centimeters only, so that continuous flow of fresh water will pass the hatches on its way to the sea along the bottom of the sluices.

Extensive and large-scale aquarium experiments did reveal that in such a situation elvers will be attracted by the fresh water and assemble themselves in front of the hatches. As soon as the velocity of the fresh-water flow diminished sufficiently--owing to a rising of the sea level at flood tide--all elvers will make for the fresh water of the IJsselmeer. As soon as the sea level is equal with that of the lake the hatches will be closed, thus preventing the salt water from flowing into the lake. By this procedure the elvers will easily reach the lake without a simultaneous entrance of noteworthy quantities of sea water.

Aquarium tests have also revealed that elvers are not the only fish species to react in this way on a flow of fresh water. Flounder and smelt, which latter forms a very important staple food for eel, pike and perch--and perch abound in the IJsselmeer--show the same type of behavior. It has been proved that adoption of the new procedure described above offers those species a chance to enter the lake, which chance they lacked before.

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PHYSICAL AND CHEMICAL PROPERTIES OF SHRIMP DRIP AS INDICES OF QUALITY

By Sammie Bethea* and Mary E. Ambrose**

ABSTRACT

Physical and chemical characteristics of drip obtained from frozen-thawed shrimp were studied to determine if changes in these characteristics could be correlated with quality as determined by a taste panel. Shrimp were tested that had been stored (1) on ice followed by a minimum of frozen storage for the formation of drip, (2) at -10° F., and (3) both on ice and at -10° F.

The pH of the drip appeared to be a satisfactory objective quality index. Drip from shrimp considered "good" by the taste panel gave pH readings of 7.50 to 8.25, from shrimp considered "acceptable," from 8.26 to 8.40, and from shrimp considered "unacceptable," 8.41 and higher. The color and optical density of the drip changed correspondingly with quality, and objective measurements of the optical density could be made with a photoelectric colorimeter. Trimethylamine nitrogen content of shrimp drip showed good correlation with spoilage but gave no indication of the state of freshness of the unspoiled shrimp. The volume of drip collected and the nitrogen content of the drip were of little or no value as a quality index.

INTRODUCTION

The requirements of a freshness test for fishery products have been stated by Reay and Shewan (1949) as follows: (a) the test must be capable of sensitively and accurately estimating the product or products of spoilage, (b) the substance or substances measured should either be absent or should be present in constant concentration in the unspoiled sample, and (c) the substance or substances must increase or decrease regularly and rapidly once spoilage has started. In addition, to be most useful, the test should quantitatively indicate the loss of freshness of the product prior to the onset of organleptically detectable spoilage.

Fig. 1 - Preparing solutions for nitrogen determination.

Fieger and Friloux (1954) and Bailey, Fieger, and Novak (1956) found that bacterial counts and measurements of the content of trimethylamine nitrogen, volatile acids, and other constituents of shrimp tissue were not sufficiently sensitive to detect deterioration prior to spoilage. Measurements of pH and of amino nitrogen content of homogenized shrimp were of value in indicating loss of freshness, but the magnitude of change was small.

A more sensitive index might be obtained if shrimp drip fluids rather than shrimp tissue were tested. It is known that many products of spoilage tend to be water soluble. Thus, they may be lost with the drip that occurs when the tissues are thawed. Capture of the drip fluids might thus offer a concentrated source of spoilage products.

In the present study, therefore, various physical and chemical changes (amount of drip, pH, color, optical density, trimethylamine nitrogen, and Folin-Ciocalteu nitrogen) observed on the drip obtained by thawing frozen shrimp that had been held under varying conditions of storage were compared with organoleptic evaluations of quality of the shrimp to determine if a more satisfactory index of quality might be obtained by analyzing the drip rather than the shrimp tissue.

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Note: Submitted for publication September 6, 1960.

EXPERIMENTAL METHODS

Table 1 presents a summary of samples, of storage procedures, and of organoleptic and physical and chemical tests. The details of the study were as follows:

Table 1 - Summary of Samples and Analyses

Data on Sample				Analyses Made On:						
				Shrimp Meat	Drip from Frozen Shrimp					
Lot Number	Species of Shrimp	Prestorage Handling	Storage Treatment	Organoleptic	pH	Color	Optical Density	Vol. of Drip	FC Nitrogen	TMA Nitrogen
1	Brown (Penaeus aztecus)	Commercial practice--about 3 days from water to laboratory	Iced for varying periods and then held frozen about 48 hours	X	X	X	-	X	X	-
			Stored at -10° F. for periods up to 6 months	X	X	X	-	-	-	-
			Iced for varying periods and then stored at -10° F. for 6 months	X	X	-	X	X	-	-
2	White (Penaeus setiferus)	Commercial practice--about 3 days from water to laboratory	Stored at -10° F. for periods up to 6 months	X	X	-	-	-	-	-
3	Brown (Penaeus aztecus)	Frozen within hours of capture. Thawed at start of experiment	Iced for varying periods and then held frozen about 48 hours	X	X	X	-	X	-	X

SAMPLES: Three lots of shrimp were used.

Lot 1: Lot 1 was composed of brown shrimp obtained from a commercial trawler at Brownsville, Tex. This lot was typical of the commercial catch in that it was a composite from several drags. The shrimp were packed in ice and shipped by air express to the laboratory at College Park, Md., where they arrived about 3 days after being caught.

Lot 2: Lot 2 was composed of white shrimp but was caught in the same area and otherwise handled in the same manner as was lot 1.

Lot 3: Lot 3 was another lot of brown shrimp from the same area. This lot was from a drag taken just before the boat returned to shore. The length of time that the shrimp were on deck before being headed and iced and the length of time on board the vessel before being landed were kept to a minimum. After the vessel arrived in port, the shrimp were frozen immediately (within several hours of catching) and were shipped to the laboratory packed in dry ice.

STORAGE PROCEDURES: The storage procedures used varied with the lot of shrimp tested.

Storage Procedure with Lot 1: The shrimp were divided into two sublots. Samples prepared from one sublot were glazed, those from the other were unglazed but overwrapped in moisture-vaporproof cellophane. Each sublot was divided into three groups, and each group was given a different storage treatment: treatment A (placed in iced storage), treatment B (placed in frozen storage), or treatment C (placed in iced and frozen storage).

TREATMENT A--ICED STORAGE: The shrimp were stored in ice for varying periods of time. Samples were randomly removed from the ice every 2nd or 3rd day for 14 days, and triplicate 10-ounce samples were packed in cartons and then frozen and either glazed or overwrapped. The freezing and glazing process required 48 hours and was necessary to condition the shrimp for the formation of drip. Two of the three samples were used for collection of drip, and the third was used for organoleptic testing.

TREATMENT B--FROZEN STORAGE: On arrival at the laboratory, the shrimp were packed in 10-ounce cartons, frozen, glazed or overwrapped, and placed in storage at -10° F.

Two cartons for collection of drip and one carton for organoleptic testing were removed monthly for 6 months.

TREATMENT C--ICED AND FROZEN STORAGE: The shrimp were stored in ice, as in treatment A. After being removed from iced storage, however, the samples were packaged, placed in storage at -10° F., and tested after 6 months.

Fig. 2 - Nitrogen determination.

Storage Procedure with Lot 2: Lot 2 was given the same storage procedure as was given lot 1 in treatment B.

Storage Procedure with Lot 3: Lot 3, after being thawed upon arrival at the laboratory, was given the same storage procedure as was given lot 1 in treatment A. No unglazed samples were prepared from this lot.

ORGANOLEPTIC PROCEDURES: The thawed shrimp were peeled, deveined, and added to 1½ pints of boiling water containing 3 teaspoons of salt, allowed to simmer for 5 minutes, removed, and allowed to cool before being served. A taste panel composed of five members was asked to judge whether the flavor and odor of the shrimp was "good," "acceptable," or "unacceptable." Numerical values of 3, 2, and 1, respectively, were assigned arbitrarily to the classifications for the purpose of treating the data quantitatively. Shrimp with a mean score of 2.3 or more were arbitrarily considered "good," those with a mean score of 2.2 to 1.7 were considered "acceptable," and those with a mean score below 1.7 were considered "unacceptable."

PHYSICAL AND CHEMICAL PROCEDURES: Volume of Drip: A standard method was developed for the collection of glaze and drip. Duplicate, frozen, 10-ounce blocks of shrimp were used. Each block was placed on a screen elevated about half an inch from the bottom of a 2-liter beaker, and the beaker was covered with "Saran Wrap" and placed in a water bath maintained at 100° to 120° F. This procedure kept the air temperature inside the beaker at 75° to 79° F., which was well below the protein-coagulation temperature of 113° F. reported by Frobisher (1946). From 45 to 60 minutes were needed to melt the glaze and separate the shrimp. As the glaze melted, it was removed periodically, leaving the shrimp still frozen. The glaze was assumed to be removed when the shrimp were no longer slippery to the touch. After the shrimp separated from the frozen block, each one was hung by the tail in a large funnel placed over a chilled graduate to collect the drip. Since no drip formed until the shrimp had been hung for 30 to 45 minutes, it can be assumed that little or no drip drained into the glaze during the time of separation of the shrimp. A standard period of 2 hours after complete removal of glaze was adapted for collection of drip.

pH Determinations: The pH of the drip was determined by means of a pH meter equipped with glass mercury electrodes. All determinations were made at room temperature (77° F.).

Color Changes and Optical Density: Color changes in drip were estimated visually. Optical densities were determined using a Klett-Summerson Colorimeter with a number 54 filter. This filter was chosen to obtain maximum sensitivity for the yellowish-colored drip samples.

Trimethylamine-Nitrogen (TMA-N): Trimethylamine-nitrogen was determined colorimetrically by the method of Dyer (1945). This method consists of extracting the trimethylamine salts with formalin, freeing the amine with potassium carbonate, and extracting the amine with toluene. The color is developed with picric acid in toluene solution. The optical density was read on a Beckman DU Spectophotometer at 410 millimicrons. The nitrogen con-

tent of a standard solution of trimethylamine-HCL was determined by a micro-Kjeldahl method.

Folin-Ciocalteu Nitrogen (FC-N): Nitrogen determinations were made colorimetrically by the modified method of Sutherland, Cori, Haynes, and Olsen (1949). This method is sensitive to protein nitrogen in very small amounts and is relatively simple to perform. The same Folin-Ciocalteu reagent has been used to measure protein decomposition in fish muscles (Wood, Sigurdsson, and Dyer 1942). The reagent reacts with aromatic phenolic compounds and trimethylamine (Dyer 1945). The intensity of the blue color resulting from the reaction of the reagent and the nitrogenous compounds contained in the drip was determined with a Beckman DU Spectrophotometer at 660 millimicrons. A solution of insulin, used as a standard, was assayed for its nitrogen content by the micro-Kjeldahl procedure.

COMPARISON OF ORGANOLEPTIC AND PHYSICAL AND CHEMICAL TESTS

The data from all tests were similar for the glazed and overwrapped sublots of shrimp. Therefore, only the results of the glazed samples are reported. Data for volume of drip, pH, TMA-nitrogen, and FC-nitrogen represent the mean of duplicate determinations.

VOLUME OF DRIP: Data on the volume of drip varied so erratically that no conclusions could be drawn. It was noted, however, that there seemed to be somewhat less drip from lot 3 shrimp than from those of lot 1, which would indicate that the special care given to preserve the quality of lot 3 shrimp may have reduced the amount of drip.

pH DETERMINATIONS: Iced Storage: The pH of shrimp drip increased regularly with increased time in iced storage and with decreased organolpetic quality (fig. 3). The decrease in organoleptic rating from "good" to "acceptable" for the lot 1 shrimp stored in ice came between the 7th and 8th day, and the decrease to "unacceptable" occurred after the 10th day of storage. The pH was 7.73 to 8.25 for drip from shrimp rated "good," 8.26 to 8.40 for drip from shrimp rated "acceptable," and 8.41 and higher for drip from shrimp rated "unacceptable."

The pH increased and organoleptic scores decreased much more gradually for lot 3 (fig. 3). The rate of spoilage was retarded, but when the quality of the shrimp dropped to "acceptable" on the 8th day, the pH of the drip was between 8.20 and 8.29. The drop in quality to "unacceptable" occurred on the 15th day at which time the pH of the drip was 8.44. Time required for quality changes in the various samples were in agreement with findings of Fieger and Friloux (1954), who showed that definite quality changes in shrimp occur after 7 days and 14 days iced storage, the latter period being when spoilage usually occurs.

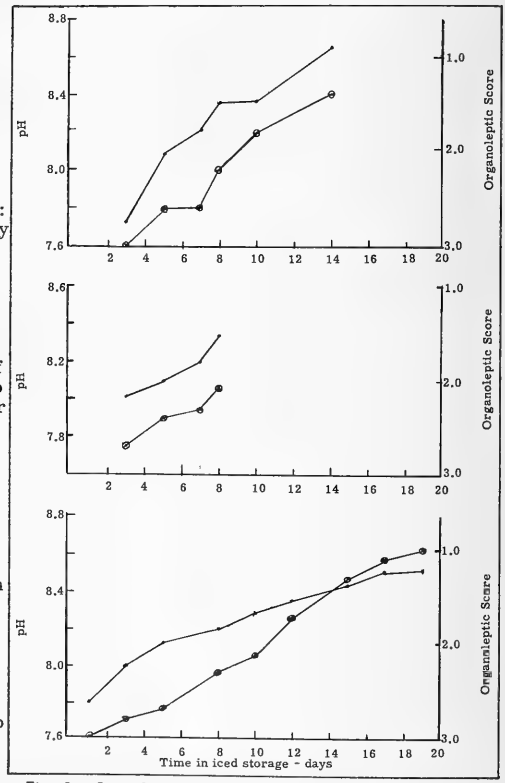

Fig. 3 - Organoleptic quality and pH of shrimp drip after iced storage and iced and frozen storage.

Frozen Storage: During the 6-months study of frozen storage, samples prepared from lot 1 (brown shrimp), and those from lot 2 (white shrimp), gave similar organoleptic scores and pH values for the drip. Both tests indicated that the shrimp remained of good quality during the entire period of testing. The data on lot 2 are presented in figure 4.

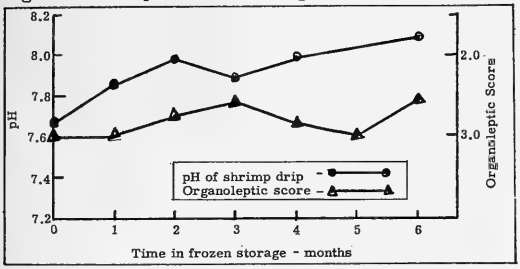

Fig. 4 - Organoleptic quality and pH of shrimp after frozen storage.

Combined Iced and Frozen Storage: Figure 3 also presents pH and organoleptic data for shrimp stored under the combination of iced and frozen storage. These pH values followed very closely those for the shrimp stored for the same time on ice but not held in frozen storage. The organoleptic scores for the samples frozen for 6 months were always slightly lower, however, than were those of shrimp tested before being frozen. Comments of the panel indicated a loss of flavor--that is, tastelessness rather than a presence of off-flavors and odors in the shrimp held in frozen storage. Thus, storage at -10° F. for periods up to 6 months does not materially affect the quality of properly-packaged shrimp, at least of the species tested.

COLOR CHANGES: With increased iced storage, the color of shrimp drip (table 2) changed in a regular manner from (a) almost transparent colorless, to (b) distinct translucent amber, to (c) opaque brown with suspended particles. These changes in shrimp drip appeared to correlate closely with changes in the quality of the shrimp. Drip that was almost

Table 2 - Some Physical and Chemical Properties of Shrimp Drip

Length of Iced Storage of Shrimp	Lot 1 After Iced Storage[1]			Lot 1 After Iced and Frozen Storage		Lot 3 After Iced Storage[2]		
	Amount of Drip Collected	Color of Drip	Folin-Ciocalteu Nitrogen	Amount of Drip Collected	Optical Density	Amount of Drip Collected	Color of Drip	Trimethylamine Nitrogen
Days	Milliliters		Milligrams Per Milliliter	Milliliters		Milliliters		Micrograms Per Milliliter
1	-	-	-	-	-	8.0	Transparent, colorless	3/<2.0
3	8.5	Transparent, colorless	1.5	12.5	0.318	7.8	Transparent, colorless	<2.0
5	9.8	Transparent, slight amber	2.9	14.0	0.356	7.5	Transparent, slight amber	<2.0
7	7.5	Transparent, distinct amber	2.2	12.5	0.426	-	-	-
8	10.0	Opaque, brown	2.0	11.0	0.554	6.8	Transparent, distinct amber	2.4
10	9.5	Opaque, brown	1.5	10.0	0.726	9.5	Opaque, brown	4.1
12	-	-	-	-	-	5.3	Opaque, brown	9.9
14	10.5	Opaque, brown suspended particles	2.4	-	-	-	-	-
15	-	-	-	-	-	5.5	Opaque, brown	17.6
17	-	-	-	-	-	5.6	Opaque, brown	31.9
19	-	-	-	-	-	6.0	Opaque, brown	35.3

1/The experiment was started approximately 3 days after the shrimp were caught.
2/The experiment was started approximately 1 day after the shrimp were caught.
3/Two micrograms per milliliter is limit of sensitivity.

colorless and transparent indicated "good" quality; drip that was distinctly amber and translucent indicated "acceptable" quality; and drip that was brown and opaque with suspended particles indicated "unacceptable" quality.

The optical density of shrimp drip (table 2) from lot 1 after iced and frozen storage showed a definite, steady increase during storage. More research work is warranted to test this characteristic of shrimp drip, since it appears to be promising as a quality index.

TRIMETHYLAMINE-NITROGEN: The trimethylamine-nitrogen content of drip (table 2) of shrimp from lot 3 showed limited correlation with organoleptic quality. This test did not reveal the loss of freshness prior to 8 days of iced storage, the trimethylamine-nitrogen concentration for the first 7 days being below 2 micrograms per milliliter of drip, the limit of sensitivity of the test. On the 8th day, however, trimethylamine-nitrogen could be detected, and thereafter, it increased regularly. Organoleptic scores and concentration of trimethylamine-nitrogen in micrograms per milliliter of drip from the same shrimp were correlated as follows: drip from shrimp of "good" quality contained less than 2 micrograms per milliliter, drip from those of "acceptable" quality contained 2 to 10 micrograms per milliliter, and drip from those of "unacceptable" quality contained over 10 micrograms per milliliter.

FOLIN-CIOCALTEU NITROGEN: The Folin-Ciocalteu nitrogen content (table 2) of drip from shrimp stored in ice remained approximately constant regardless of shrimp freshness. The results thus showed no apparent correlation with the quality of the shrimp.

SUMMARY AND CONCLUSIONS

Changes occurring in physical and chemical properties of drip from shrimp held in iced and frozen storage were studied for use as possible improved quality indices for the freshness of shrimp.

The pH and color changes of shrimp drip appeared to be satisfactory objective indices of shrimp quality. The pH appeared to be useful both as a spoilage test and as a freshness test to show the changes in quality before spoilage. This test was sensitive to changes before other objective tests were, such as trimethylamine-nitrogen. Color changes in drip followed a definite pattern from colorless and transparent for "good" quality shrimp, through amber and translucent for "acceptable" quality shrimp, to brown and opaque for "unacceptable" quality shrimp. Changes in optical density of shrimp drip increased with decrease in quality.

Trimethylamine-nitrogen was of no value as an indicator of prespoilage change in quality of shrimp, but it was a good indicator for the onset of spoilage. Determinations of volume of drip and of Folin-Ciocalteu nitrogen content of the drip were of no value as quality indices.

The pH of the drip was slightly higher than the pH of the whole shrimp, but the magnitude of the changes in pH when the shrimp changed from "good" to "acceptable" quality and then to "unacceptable" quality were no greater for the drip than for the whole shrimp as reported by Bailey, Fieger, and Novak (1956). The only advantage in the use of drip for taking pH measurements would therefore be that no equipment for homogenization is necessary, as it is for measurements on the whole shrimp. The observation of the color and transparency of the drip as an indication of quality would be useful under conditions where the usual laboratory equipment is lacking.

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TRENDS AND DEVELOPMENTS

Fishing Vessel and Gear Developments

EQUIPMENT NOTE NO. 8--
NEW HYDRAULICALLY-DRIVEN BLOCK SPEEDS HAULING CRAB-POT WARPS:

A Seattle, Wash., company has recently patented and introduced a new type of power block designed to improve handling of crab-pot gear and long lines. The equipment consists of a hydraulically-driven aluminum block weighing approximately 130 pounds and having a bronze V-sheave that can be preset to accommodate lines from $\frac{5}{16}$ inch to $\frac{5}{8}$ inch in diameter (fig. 1). This block is suspended from a short boom that can be raised or lowered hydraulically.

Besides handling the gear faster with less work, the block is said to eliminate line slip-

Fig. 1 - Hydraulic power block for hauling crab pots and long-line gear.

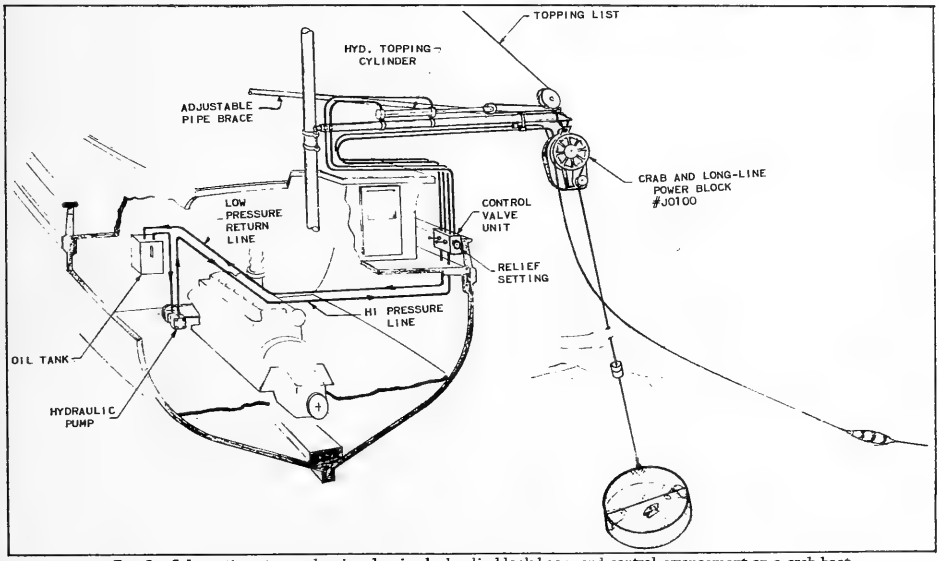

Fig. 2 - Schematic cutaway drawing showing hydraulic block boom and control arrangement on a crab boat.

page and, thus, does not wear or melt plastic pot warps. By means of special hydraulic controls, the maximum pulling power can be adjusted to a point where it will not exceed the parting strength of the line. This feature is important to the fisherman working in rough seas or with stuck gear.

When the gear is to be hauled, the boom is swung outboard (fig. 2) to clear the side of the hull and is lowered to allow the warp to be placed in the V-sheave at the time the buoy is picked up. The boom is then raised to a point where the pot will clear the bulwarks. The buoy and the hauling warp are played back into the water. When the pot has been raised to its maximum height, it is pulled inboard, the sheave is simultaneously reversed, and then the boom is lowered. After removal of the warp from the sheave, the block is ready to receive the next pot warp.

Trials of the equipment by experienced commercial crab fishermen have shown that a loaded Dungeness crab pot with 35 fathoms of warp can be handled completely in 1 minute. Operations are continuous while the boat is under way. It is reported that strings of up to 50 pots have been hauled in 60 minutes.

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Division of Industrial Research,
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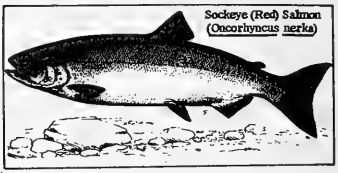
Alaska

FORECAST FOR 1961 BRISTOL BAY SOCKEYE SALMON RUN:

A preliminary forecast of the 1960 Bristol Bay red or sockeye salmon run was released by the Commission of the Alaska Department of Fish and Game on November 17, 1960. The forecast was prepared by the three agencies involved in fisheries research work in Bristol Bay--Alaska Department of Fish and Game, U. S. Bureau of Commercial Fisheries, and Fisheries Research Institute of the University of Washington. Scientists from the three agencies exchanged and studied all pertinent data and believe the analysis is the best that can be made with the available information. Further study of the data is being continued and slight changes from the original estimate might result.

The analysis indicates a good total run for Bristol Bay in 1961, or about 22 million salmon. A very poor return of about 1.3 million fish is indicated for the Nushagak district; a good return of about 15 million fish to the Naknek-Kvichak; a good return of over 2 million fish to the Egegik, although the cycle analysis upon which this is based is relatively weak; and an excellent run of over 3 million to the Ugashik, although in this instance, also, the margin of error is considerable. The estimate assumes no Japanese fishing on the returning mature salmon in 1961.

The forecast is based on previous cycles, the seaward migration of young salmon in 1958 and 1959, and the abundance of young salmon in 1960.



The high-seas sampling at sea by gill nets and seines which indicated the abundance of these fish in 1960 also gave clues as to the probable size of the fish in the 1961 run. Samples taken at sea showed a low abundance of one-year ocean fish (two-year ocean in 1961) suggesting a heavy ocean mortality on those young red salmon which went to sea in the spring of 1959. The catches indicate the majority of the fish returning to Bristol Bay in 1961 will be large fish with three years of ocean life.

The Commissioner stated that this joint effort in forecasting the 1961 Bristol Bay red run was done for the benefit of management and industry. The Alaska Board of Fish and Game may now plan its regulations around these figures and the fishermen and processors may prepare their fishing and canning capacity to properly utilize the 1961 runs.

The scientists also emphasized, although these predictions were made from the best available data, that in some instances a sufficient accumulation of data is not available to properly predict and that considerable variation in the actual size of the runs from that predicted may be expected. Further evidence of the actual size of the total run will become available from the high seas sampling in the spring of 1961. Management is sufficiently flexible to adjust fishing pressure to correct for either a smaller or larger run than predicted.

* * * * *

HARVESTING ANNUAL SALMON RUNS CREATES GREAT INTEREST:

Alaska may not have a "World Series," but the harvesting and processing of her annual salmon runs equals the famed series in tension and excitement. But Alaskans are not mere spectators; they take an active part in harvesting the salmon. The salmon come up the streams from the salt-water areas stretching from Ketchikan to Bristol Bay. Approximately 50 canneries along the North Pacific and Bering Sea coastlines can salmon. As the season advances and the pack figures climb, they are studied in every Alaskan coastal community.

When the 1959 fishing season ended, every community began to indulge in guessing the size of next season's catch. Fishery biologists made their generally conservative forecasts based, among other things, on scientific data of cyclic runs and escapements.

For 82 years since the first Alaska cannery was established in the native village of Klawok in 1878, this interest and concern in the annual salmon runs has grown. Fishing, like hunting and prospecting, is a gamble intensified by uncertainty and the sweet promise of success. Far more importantly, as the industry grew and the size of the runs dwindled, numerous communities found fishing almost their sole means of support. Places like Klawok, Craig, Hydaburg, Metlakatla, Petersburg, Hoonah, Pelican, Elfin Cove, Yakutat, Cordova, Chignik, Sand Point, Naknek, and Dillingham to mention a few were conscious that their very survival depended on a good season's fish catch.

After the comparatively simple oar-and-sail days their fathers knew when there was an abundance of fish, fishing for the individual fisherman has become a highly technical and mechanized business that requires expensive equipment and upkeep. This often involves being financed by a cannery or bank which results in a need for regular payments of principle and interest that can only be met by successful fishing seasons.

In 1960, the fishermen flocked to their respective fishing areas in May. As the season advanced and more areas opened, the coastal waters from Ketchikan to Bristol Bay began to bristle with a formidable array of fishing gear. A total of 12,000 fishermen, manning approximately 5,000 fishing boats, using 336,000 yards of purse seines, 301,000 yards of anchor and shore set nets, 952,000 yards of gillnet, 32,000 troll hooks along with 11 fish traps and eight fish wheels were ready or being readied to intercept by one method or another millions of the salmon that have, since time immemorial, made their annual pilgrimage from the sea to their natal streams, to spawn and in some cases die.

The first 1960 returns were recorded by the Alaska Fish and Game Department during the week ending May 29.

Except for a few scattered endeavors, the week ending September 25 marked the end of the 1960 salmon canning season. Preliminary figures showed Southeastern Alaska's final pack totaled 304,543 cases, which was far below the annual average of the last five years of 943,425 cases. However, the Central district's 1,200,310 cases and Western's 1,044,692 cases brought the grand total of Alaska's preliminary pack figures to 2,549,545 cases, or 771,256 cases above 1959.

The wholesale value of Alaska's salmon pack in 1956 was $78,577,000. In 1959, the pack value had sagged to $49,493,000. In 1960 it was up again to 78,500,000. For many, of course, in the areas where the runs failed to materialize, there would be hardship and the long wait for next season's catch.

The Alaska Department of Fish and Game is striving to build up the fisheries to where these wide fluctuations will be replaced by a fishing industry stabilized by a program of maximum sustained yield.

* * * * *

SIXTH SPECIES OF SALMON CAUGHT IN ALASKAN WATERS:

The identification of the sixth species of salmon being landed in Alaska, was announced by the Westward Regional Supervisor of Alaska's Commercial Fisheries Division. On August 15, 1960, while at a False Pass salmon cannery, he had occasion to examine a salmon that had been laid aside in the fish house. Neither the cannery superintendent or the Regional Supervisor could positively identify the fish. It was thought that it was a hybrid or possibly a species that occurs on the Siberian Coast (Oncorhynchus masou or the Masu salmon).

It was agreed that the salmon should be frozen and transported to the taxonomist at the University of Washington College of Fisheries, for possible identification. His identification was Oncorhynchus masou as the specimen fit all the classifications used to describe the species.

The specimen was a female with well-developed eggs and had spent two winters in the ocean. The physical characteristics of the salmon appeared to be a combination of several features of the other five species. One of the most obvious was the large number of small scales present as on the pink salmon. The head resembled a female chum slamon. There were a small number of fine black spots spread the length of the back from the head to the caudal peduncle, which was slender and rounded as a chum salmon. The tail structure and color resembled a red salmon and the meat color was pale pink. A dark green coloration above the lateral line was retained many hours after death.

The cannery superintendent said that this species has been landed at the False Pass cannery on several occasions in past years from the Alaska Peninsula area but not identified before. This particular specimen was believed to have been caught in Balboa Bay near the Shumagin Islands.

American Samoa

TUNA LANDINGS, OCTOBER 1960:

Tuna landings by Japanese long-line fishing vessels for the United States-owned tuna cannery in American Samoa amounted to 1.7 million pounds in October 1960 as compared with 2.3 million pounds in October 1959. The January-October 1960 total of 22.3 million pounds was up 2.4 percent from the same period of 1959.

American Samoa Tuna Landings, October 1960

Species	October		Jan.-Oct.	
	1960	1959	1960	1959
	(1,000 Lbs.)			
Albacore	1,620	2,075	19,070	17,359
Yellowfin	73	187	2,064	3,618
Big-eyed	14	78	1,179	826
Skipjack	-	3	10	7
Total	1,707	2,343	22,323	21,810

Note: All of the tuna was landed by Japanese long-line vessels.

Byproducts

NEW TECHNICAL ADVISORY UNIT TO STIMULATE RESEARCH ON FISH MEAL AND OIL:

A new Technical Advisory Unit whose purpose is to stimulate research on fish meal and oils, and to correlate and make effective use of research findings for the benefit of industry, has been set up within the U. S. Bureau of Commercial Fisheries. Samuel R. Pottinger, Director of the Bureau's new Technological Laboratory in Gloucester, has been assigned to supervise the new program, with headquarters in Boston.

In describing the new program, the Director of the North and Middle Atlantic Region of the Bureau said, "With a view to finding new and more profitable markets for fish meal and oil, this new research team, composed of chemists and nutritionists, will endeavor to translate a great deal of research that is being carried on all over the country into a more usable tool for our meal and oil industry."

Pottinger, who has served with the Bureau for over 30 years, started with a team of five fishery technologists and built the East Boston, Mass., Laboratory, into an effective research organization, which in the spring of 1960 occupied the new Gloucester Laboratory, the best equipped laboratory of its kind in the United States.

California

BIG 1960 SALMON RUN TO SACRAMENTO RIVER:

An outstanding salmon run, which already has toppled one record, was in progress in November 1960 on the Sacramento River and tributaries, the California State Department of Fish and Game reported on November 25, 1960. The State's Nimbus Hatchery on the American River recorded 22,195 salmon in 1960, compared to 7,154 at the same time in 1959. With nearly two more months of run expected, the American River had a record run at the hatchery. Since the hatchery began operations in 1955, the top year was 1959 when 13,212 fish climbed its ladder. Egg take so far in 1960 was 14,296,700 as compared to 11,078,000 in 1959 on the same date in 1959. The record was set in 1959 when 38,949,200 eggs were taken.

The good run extended all the way up the Sacramento River. With the fish trap at Keswick Dam opened only one week, some 5,000 fish had been reported. Another 8,000 fish ascended Battle Creek near Anderson and moved into Coleman Fisheries Station, the Federal hatchery, where the Keswick-trapped fish were also being taken. Egg take at Coleman was near the 14,000,000 mark. In 1959 the total take for the season, which ended in January, was 53,000,000 eggs.

Coleman Station also reported a very good steelhead run in progress up the Sacramento River.

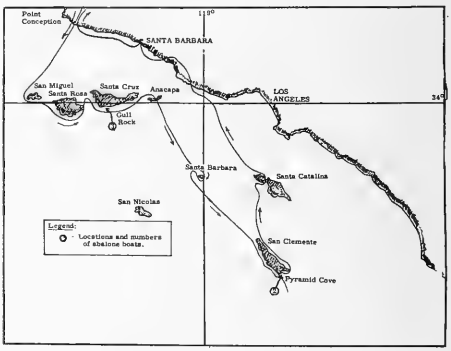
The Department of Fish and Game says the Yuba and Feather Rivers also supported good king salmon runs, both appearing to be as good or better than in 1959.

Runs up the lower streams--Tuolumne, Stanislaus, and Merced--were just beginning towards the end of November 1960.

* * * * *

INVESTIGATION OF ABALONE RESOURCES CONTINUED:

Airplane Spotting Flight 60-21 Abalone: The coastline from Santa Barbara to Pt. Arguello and the Islands of San Miguel, Santa Rosa, Santa Cruz, Anacapa, Santa Barbara, San Clemente, and Santa Catalina, was surveyed from the air on September 23, 1960, by the California Department of Fish and Game Twin Beechcraft to observe locations and numbers of commercial abalone boats.



Abalone resources investigation--airplane spotting flight 60-21, September 23, 1960.

Observations were limited along the coastline from Pt. Conception to Santa Barbara because of fog. The inshore sides of the Northern Channel Islands were obscured by fog, but visibility was excellent at Santa Barbara, Santa Catalina and San Clemente islands.

Three abalone boats were working in the Gull Rock area, Santa Cruz Island and two boats, one with diver on the bottom, were at Pyramid Cove, San Clemente Island.

The kelp beds around the islands were still relatively dense, but some sloughing off was evident.

Weather conditions had only recently improved, which may have accounted for the few boats in operation.

Note: Also see Commercial Fisheries Review, December 1960 p. 25.

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PELAGIC FISH POPULATION SURVEY CONTINUED:

Airplane Spotting Flight 60-19 - Pelagic Fish: The inshore area from the United States-Mexican Border north to Bolinas Bay was surveyed from the air (Sept. 12-15, 1960) by the California Department of Fish and Game Cessna "182" 9042T, to determine the distribution and abundance of pelagic fish schools.

South of Point Conception the weather was fair to good but it was poor in central California. Very few fish schools were found in any area.

In southern California, only four small sardine schools (three miles west of the town of San Clemente) and one group of about 15, small, deep anchovy schools (two miles off Paradise Cove) were seen. The water along the entire southern California coast was generally clean and the red tide of the past two months was not in evidence.

Observations in central California were hampered by a low overcast and fog but a small school-group of sardines was found one mile west of Gamboa Point. These schools were being harassed by hundreds of porpoises, sea lions, and birds, and it was not possible to estimate the magnitude of the group. About 50 thin anchovy schools were seen close to shore between the town of Santa Cruz and the Salinas River. Commercial spotters have reported that anchovy schools are abundant but very few sardine schools are present.

Airplane Spotting Flight 60-22 - Pelagic Fish: The survey from the air to determine the distribution and abundance of pelagic fish schools was continued (Oct. 10-13, 1960) by the Department's Cessna "182" 9042T, in inshore area from the United States-Mexico border north to the Russian River.

Weather and visibility conditions were generally good and complete coverage of the entire range of the survey was possible.

No significant number of fish schools has been found in the inshore area since July 1960 when a moderate concentration of anchovies was seen near Santa Barbara and Port Hueneme. October was no exception and only 135 schools were sighted. Most of these (109) were anchovy schools found in shallow water in Monterey Bay near Aptos Creek and off the town of Capitola.

A total of seven anchovy schools was seen in southern California--one off the mouth of the Tijuana River and six in the vicinity of the New Port Beach pier.

A school group of sardines was found off the town of Oceanside and 18 "breezing" schools were counted. This number is no measure of the magnitude of the group because the schools were quite wild and would appear and disappear frequently during a short period of time.

The water along the entire coast was uniformly clean and clear.

Note: Also see Commercial Fisheries Review, Dec. 1960 p. 27.

Cans--Shipments for Fishery Products, January-September 1960

Total shipments of metal cans during January-September 1960 amounted to 97,904 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 93,065 tons in the same peroid of 1959. As of the end of September, the peak canning season for salmon had ended and that for Maine sardines was beginning to taper off. The pack of California sardines for one month s fishing was very poor

and if this trend continues, the total shipments of tinplate for fish cans in 1960 will be about the same or lower than the total shipments in 1959.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.

Central Pacific Fisheries Investigations

IDENTIFICATION OF PACIFIC TUNA LARVAE:

As one phase of research on the biology of the Pacific tuna, the U. S. Bureau of Commercial Fisheries Honolulu Biological Laboratory has been working on the identification of tuna larvae. Such identifications are necessary, in part, for successful completion of studies concerned with the area, time, and success of spawning, and the distribution, abundance, and ecology of the larvae.

Skipjack, and yellowfin tuna and frigate mackerel larvae were identified from samples collected by Bureau research vessels during cruises to the central and eastern Pacific and preliminary studies of their distribution, abundance, and ecology were made. Lacking identification of the larvae, such studies were not possible for the big-eyed, albacore and bluefin tuna. Recently, using tuna larvae collected by the Dana (a Danish oceanographic expedition) during the 1928-30 cruise around the world, albacore, big-eyed, and bluefin larvae from the western Pacific have been tentatively identified.

The area surveyed by the Dana was divided into four geographical units, the Formosan waters, southern half of the South China, Sulu and Celebes Seas, the waters off New Guinea, and the eastern Indian Ocean (off northern end of Sumatra). From each of the areas, after removal of identifiable larvae such as yellowfin and skipjack tuna, the remainder could then be segregated into one or more "types." Comparison of those types with catch records of adults revealed a correspondence in the numbers of adult species reported from each area and the types of larvae. For example, in the Sulu and Celebes Seas, where only big-eyed are caught on long line, one larval type was found in abundance and was therefore designated as big-eyed. In the waters off Sumatra, both albacore and big-eyed are regularly taken by long line. Larvae from those waters fell into two general types, one similar to that from the Sulu and Celebes Seas and designated as big-eyed; the other has been designated as albacore. In Formosan waters, where adult bluefin, as well as albacore and big-eyed, are caught, a similar line of reasoning resulted in the segregation of the larvae into the three types, the albacore, big-eyed and bluefin tuna.

Further confirmation comes from study of Central Pacific larvae collections. Adult bluefin tuna are rarely caught (one reported every 5 to 10 years) in that area and the type designated as bluefin larvae is absent from the collections.

Studies to confirm these identifications, using tuna larvae collected from Bureau vessels operating in the central and eastern Pacific, are presently under way. In addition, identifying characteristics such as meristic counts and distribution of chromatophors are being studied.

Dams

INTERIOR DEPARTMENT RECOMMENDS AGAINST IMMEDIATE POWER LICENSE ON MIDDLE SNAKE:

The Department of the Interior has advised the Federal Power Commission that it is unnecessary for a power development at either the Mountain Sheep or Nez Perce sites on the Middle Snake River in the Pacific Northwest to be undertaken at the present time and for some years to come.

In a letter signed by Acting Secretary Elmer F. Bennett, the Department pointed out that the proposed Columbia River treaty with Canada will permit other major hydropower development on the Columbia River system and hence the proposed Middle Snake projects can be delayed pending further efforts to resolve the fishery problem.

The Department's letter calls attention to the White House statement of October 19 announcing President Eisenhower's approval of the proposals on Canadian storage which have been agreed to between the United States and Canadian negotiators. The White House statement said,

"Due to the location of this proposed storage, there will be no interference with

the cycle for salmon and other anadromous fish, which constitute such an important and recreational asset for the people of the Pacific Northwest."

"The large block of flood control storage and power that will be realized over the next decade as a result of this cooperative undertaking affords us a greater degree of selectivity in the planning and timing of potential domestic projects in order to take into fullest consideration conservation as well as purely economic needs. Sorely needed time will be gained which can be devoted to the research and study which must go into the solution of the problem, particularly pressing today in our northwest States, of harmonizing construction of large storage dams with fish and wildlife needs. In this way the agreement can make a maximum contribution to the fostering of conservation in its highest sense, the optimum harmonization of our multipurpose needs."

The Snake and Salmon rivers are of critical importance in maintaining the salmon fishery resources of the Columbia River system and a high dam at either Mountain Sheep or Nez Perce sites would drastically affect both upstream migration of the anadromous fish to spawn and the return of young fish to the sea.

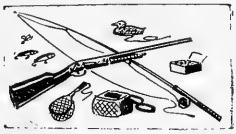
The Department pointed out that as between the two proposed Snake River dams, the Nez Perce project, which would be located below the confluence of the Snake and Salmon rivers would have the greater impact on anadromous fish. However, the Department recommends that project construction at either site be deferred while full advantage is taken of the opportunity for storage and hydrodevelopment presented by the proposed treaty with Canada.

Federal Aid Funds for Fish and Wildlife Restoration

Federal Aid funds totaling $21,425,402 have been apportioned to the states for their fish and wildlife restoration programs for the year ending June 30, 1961, Secretary of the Interior Fred A. Seaton announced November 25, 1960. This includes the partial apportionment of $12,800,000 made available to the states on July 1.

Of the total amount $15,589,708 is for the restoration of game and $5,835,694 is for the restoration of fish.

These funds are derived from Federal excise taxes collected from the manufacturers--an 11-percent tax on sporting guns and ammunition for the restoration of game (Pittman-Robertson Act, approved September 2, 1937) and a 10-percent tax on fishing rods, reels, creels and artificial lures, baits and flies (Dingell-Johnson Act, approved August 9, 1950). Both taxes apply on the manufacturer's price.



The programs are administered by the Bureau of Sport Fisheries and Wildlife, U. S. Fish and Wildlife Service.

Federal Aid money is matched by state money on the basis of not to exceed $3 Federal Aid to $1 state funds, although according to the provisions of the Acts the states carry out all projects with their own funds, and are reimbursed for up to 75 percent of project costs.

Note: Also see Commercial Fisheries Review, August 1960 p. 21.

Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-OCTOBER 1960:

Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 1.8 million pounds (value $921,000) of fresh and frozen fishery products were purchased in October 1960 by the Military Subsistence Supply Agency. This was higher than the quantity purchased in September by 4.7 percent but was 9.2 percent under the amount purchased in October 1959. The value of the purchases in October 1960 was lower by 0.8 percent as compared with September and 13.3 less than for October 1959.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, October 1960 with Comparisons

QUANTITY				VALUE			
October		Jan.-Oct.		October		Jan.-Oct.	
1960	1959	1960	1959	1960	1959	1960	1959
(1,000 Lbs.)				($1,000)			
1,766	1,945	19,488	19,433	921	1,062	10,109	10,035

During the first 10 months of 1960 purchases totaled 19.5 million pounds (valued at $10.1 million)--an increase of 0.3 percent in quantity and 0.7 percent in value as compared with the same period in 1959.

Prices paid for fresh and frozen fishery products by the Department of Defense in October 1960 averaged 52.2 cents a pound, about 0.4 cents more than the 51.8 cents paid in September, but 2.4 cents less than the 54.6 cents paid during October 1959.

Canned Fishery Products: Salmon was the principal canned fishery product purchased for the use of the Armed Forces during October this year. In the first 10 months of 1960, purchases of canned tuna were up 20.7 percent and canned salmon were up 435.5 percent as compared with the same period in 1959. However, canned sardine purchases during January-October 1960 were down--87.9 percent as compared with the same months of 1959.

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, October 1960 with Comparisons

Product	QUANTITY				VALUE			
	October		Jan.-Oct.		October		Jan.-Oct.	
	1960	1959	1960	1959	1960	1959	1960	1959
	(1,000 Lbs.)				($1,000)			
Tuna	771	100	3,141	2,602	349	44	1,393	1,203
Salmon	1,285	653	3,593	671	868	466	2,436	470
Sardine	25	51	124	1,025	10	21	51	165

Note: Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.

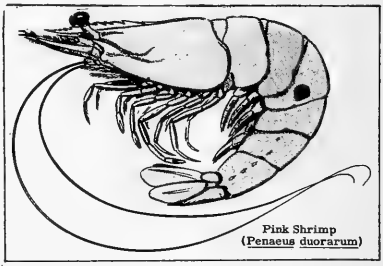
Florida

FISHERIES RESEARCH THROUGH SEPTEMBER 1960:

The Marine Laboratory of the University of Miami is carrying on research on fisheries with funds provided by various sources, including the Florida State Board of Conservation and the U. S. Fish and Wildlife Service. The research of interest to commercial fisheries contained in the Laboratory's September 1960 Salt Water Fisheries Newsletter follows:

Larval Shrimp: Study of the early life stages of the pink shrimp, the species which supports the important Tortugas fishery near Key West, Fla., is being carried on at the Laboratory with funds provided by the U. S. Fish and Wildlife Service. Investigation has been aimed at charting the spawning area and the spawning season of this species. Spawning of pink shrimp takes place in offshore waters from about 12 to 25 fathoms in depth. No very young larval stages have been taken in inshore waters of less than eight fathoms, although older postlarvae and young adults are present there. At depths of greater than 50 fathoms, no larvae have been found. There appears to be a strong westerly current in these deeper waters which might carry any larvae present into areas unsuitable for their further growth.

Some spawning of pink shrimp takes place all during the year. Only about two weeks are required for the shrimp to complete its larval life, but some of these very young shrimp are found each month of the year. The peak of spawning is from about June to September. The method by which the larvae move from the offshore spawning grounds over 90 miles to the shallow bays where they continue their growth are presently being studied.



Pink Shrimp
(Penaeus duorarum)

Spotted Sea Trout: A tagged spotted sea trout released at Apalachicola, Fla., was recaptured at Grand Isle, La. Although this migration was well over 250 miles, the majority of west Florida tagged trout have been recaptured within 30 miles of the tagging area.

This tagging program was begun with the support of the Florida State Board of Conservation to determine migrations and growth rates. Tagged sea trout were released on the west coast of Florida, and about 10 percent have been returned. Two types of tags are being used. One consists of a small green "internal" or "body cavity" tag which is inserted in the body cavity of the fish. This tag is found when the fish is cleaned or gutted.

The second type of tag consists of a piece of yellow plastic tubing attached to a body cavity tag. The tubing protrudes externally from the fish's body to aid detection.

Winter growth was much slower than growth during warmer months. The average annual growth per fish was estimated at about three inches.

Frozen Breaded Shrimp Quality: The great demand for frozen breaded shrimp has led to an investigation of the bacteria present in the product. There are many temperature fluctuations that occur during the distribution cycle, therefore, tests are being carried out to determine the relation of time and temperature to the numbers of bacteria.

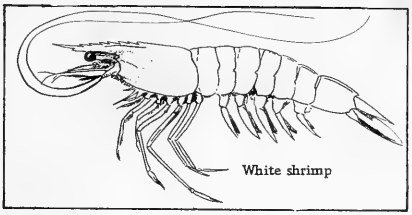
Preliminary results have shown a decrease in bacteria due to freezing immediately after processing, followed by a slight increase during a six-hour thaw at room temperature. This work is supported by the National Institute of Health.

Nonutilized Species Incidental to Shrimp Fishing: A large quantity of nonutilized fish is caught incidentally to the shrimp fishery. The fish that come up in the drag nets include many species, some of them edible, but since there is no market for them they are discarded.

A project has been started to develop a method of preserving these nonutilized or "trash" fish and finding uses for them. A method of holding the fish without refrigeration is under study. It consists of a hydrolysis or digestion of the fish by the naturally-occurring enzymes of the fish. These enzymes are related to gastric juices of the fish and will act on the meat.

One of the most likely applications for the "liquid fish" is in the fertilizer industry, for it can be fortified by the addition of chemicals and converted into a complete fertilizer with any desired formula. At least two large citrus growers in the central part of Florida are using a byproduct from the manufacture of fish meal, which does not contain all the ingredients of liquid fish. Both growers have reported good results from the applications of fish fertilizer.

The State Board of Conservation and the Small Business Administration are supporting the trash fish studies.



White shrimp

Reaction of Shrimp to Light Studied: Investigations on the reactions of pink shrimp, Penaeus duorarum and white shrimp, P. setiferus, to light rays of different types has been set in motion with the contract approval from a National Science Foundation grant. Since these two species of shrimp have opposite light activity rhythms, the study may provide a better description of their behavior. This may open up the possibility of using illuminated shrimp trawls in midwater for trawling over rough bottoms.

Note: Also see Commercial Fisheries Review, March 1959 p. 34; November 1960 p. 29.

Food Spoilage

GRANT MADE FOR STUDY OF NEW APPROACH TO CONTROL OF FOOD SPOILAGE:

Research has been initiated on a new approach to the control of food spoilage. The Refrigeration Research Foundation announced the latter part of 1960 this research has been undertaken under the direction of a member of the Foundation's Scientific Advisory Council. The member is also Chairman of the Food Technology Department at Oregon State College.

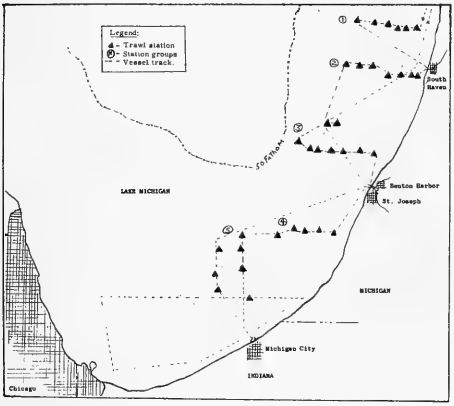
The grant with which the research is financed is from the U. S. Department of Health, Education, and Welfare. Basically the grant was made to study the food preservation properties of Vitamin K 5.

Vitamin K 5 is the only vitamin known to destroy spoilage agents in food. It is found in green leafy vegetables, cheese, liver, egg yolk, and tomatoes. Heat does not destroy the vitamin and it is possible that by adding it with freezing and canning methods, the refrigerator shelflife of foods may be extended as much as six weeks after exposure to air. (Industrial Refrigeration, October 1960).

Great Lakes Fisheries Exploration and Gear Research

COMMERCIAL POTENTIAL OF UNDER-UTILIZED FISH STOCKS IN LAKE MICHIGAN SURVEYED:

M/V "Capitol I" Exploratory Cruise 3: The third in the 1960 series of trawl explorations in Lake Michigan was carried out between South Haven, Mich., and Chicago, Ill., by the U. S. Bureau of Commerical Fisheries chartered vessel Capitol I, a former Gulf of Mexico shrimp trawler. The objectives of the seven-day cruise (ending October 1) were to determine the abundance and seasonal distribution of the various species of fish inhabiting the area and to learn the location of areas suitable for trawling.



The third 1960 exploratory cruise by Capitol I.

Some thirty-four 30-minute drags were completed in various depths between 10 and 42 fathoms using a standard, 50-foot (headrope), Gulf of Mexico balloon-type fish trawl. Catches ranged from 70 to 1,170 pounds of mixed chubs, bloater chubs, and alewives per drag. Best fishing results were obtained north of Michigan City, Ind., in Michigan waters, at depths of 15 to 35 fathoms. Seven drags in this area caught fish (96 percent L. hoyi) at an average rate of 793 pounds per hour. In four other localized areas this depth range produced fish at average rates of 345, 461, 497, and 498 pounds per hour. Considering the entire cruise area, the 20- and 30-fathom depth range was most productive with 18 drags catching an average of 639 pounds per hour.

Alewives were caught in amounts of 5 to 180 pounds and averaged 59 pounds in 13 drags scattered throughout the area in the 15- to 25-fathom depth zone. Smelt, whitefish, and herring were taken in amounts of 10 pounds or less per drag, and yellow perch were caught in amounts of 10 pounds or less per drag, and yellow perch were caught in amounts of 1 pound or less in 11 drags.

Extensive soundings of Indiana waters revealed unfavorable bottom conditions for trawling. Adverse weather conditions interfered with fishing operations during one day of the cruise.

Note: Also see Commercial Fisheries Review, Novemb_r 1960 p. 30.

Great Lakes Fishery Investigations

LAKE ERIE FISH POPULATION SURVEY FOR 1960 SEASON COMPLETED:

M/V "Musky II" October 1960: The 1960 field operations of the U. S. Bureau of Commercial fisheries research vessel Musky II on Lake Erie were terminated for the year at the end of October. Surface-water temperatures in western Lake Erie remained near 64° F. from October 1 to 17 but dropped to 52° F. by October 25. The growing season of most species in Lake Erie is 4 to 5 months when water temperatures are above 60° F.

Commercial catches generally were low in United States waters in October. Yellow pike contributed strongly to the catch in most areas. The average lengths of yearling yellow pike in the fishery in Ohio (7 ports) and Michigan (1 port) ranged from 14.3-14.6 inches. Average length in New York ports was only 12.9 inches.

Tagged yellow pike have been reported principally from western Lake Erie, but one was recovered from the St. Clair River north of Detroit and one from Dunkirk, N. Y.

Although goldfish (most are brownish colored) do not contribute greatly to total production in Lake Erie (157,000 pounds in 1958), they are abundant in some areas. Goldfish average 5 to 6 inches long at the end of the first year of life and about 9 inches at the end of the second year. Larger specimens are about 14 inches long and weigh a-

bout 2 pounds. Spawning checks on the scales of fish 2 years of age and older are almost identical to annuli. Determining the age of older fish is difficult.

The abundance and growth of young fish generally was much poorer in 1960 than in 1959. For example more young yellow pike and yellow perch were taken in some single trawl tows in 1959 than in all tows combined (approximately 400 tows) in 1960. It is little wonder that the sport and commercial catches of some species vary so greatly from season to season and year to year.

Samples of brown bullheads taken by the commercial fishery in October averaged 10.1 inches long and $\frac{1}{2}$ pound in weight; channel catfish averaged 16.2 inches long and $1\frac{1}{4}$ pounds in weight.
Note: Also see Commercial Fisheries Review, Dec. 1960 p. 33.

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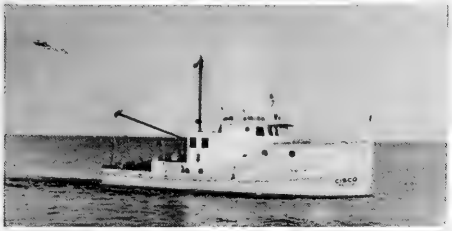
LAKE MICHIGAN FISH POPULATION SURVEY CONTINUED:

M/V "Cisco" Cruise 9: The fish population survey in Lake Michigan was continued (October 11-25, 1960) by the U. S. Bureau of Commercial Fisheries research vessel Cisco.



Research vessel Cisco.

Gangs of nylon gill nets (50 feet each of $1\frac{1}{4}$- and $1\frac{1}{2}$-, 100 feet of 2-, and 300 feet each of $2\frac{3}{8}$-, $2\frac{1}{2}$-, $2\frac{3}{4}$-, 3-, $3\frac{1}{2}$-, and 4-inch mesh) were set overnight at 25 and 50 fathoms off St. Joseph, Mich., and at 25 fathoms off Grand Haven. Chub catches were light and practically all Leucichthys hoyi in both 25-fathom sets, but moderately heavy, with more of other chub species, in the 50-fathom sets.

A gang of nylon gill nets was set for 13 nights at 88 fathoms in midlake west of Holland, Mich. The catch was extremely heavy: 3,516 L. hoyi, 61 L. kiyi, 32 L. zenithicus, 61 lake herring, 38 fourhorn sculpins, and 1 burbot. The burbot, which weighed 2 pounds, was the first taken in 1960. It was not lamprey-scarred.

In order to study differences in catch from gill nets set for various lengths of time, and to study variations in identical sets, gill nets were lifted off Grand Haven as follows: first day, a 1-night set; second day, a 2-night set; third day, a 1-night and a 3-night set; sixth day, a 3-night and a 6-night set. The catches in all nets were practically all L. hoyi. The 1-night sets took 368 and 596 chubs, respectively; the 2-night set 581; the 3-night sets 892 and 723; and the 6-night set 1,256. The nets used during the second 3-night and the 6-night sets were loaded with current-transported weeds and trash. Gale winds blew almost constantly the day and night before the nets were lifted. It is doubtful that the nets fished properly during the last night. None of the mesh sizes in other sets appeared to be "loaded up" at the end of 3 days.

Gangs of linen gill nets were set for 5 nights at 25 fathoms (255 feet each $2\frac{3}{8}$-, $2\frac{1}{2}$-, $2\frac{5}{8}$-, $2\frac{3}{4}$-, and 3-inch mesh) and 50 fathoms (510 feet of each of the above mesh sizes). At both depths these nets took more L. hoyi and less individuals of other chub species than did identical nets set on about the same date in 1954.

The L. kiyi spawning season appeared to be near. Only one fully ripe individual was examined. No spent fish were seen.

A 52-foot commercial-type balloon trawl was fished at several depths off St. Joseph and Grand Haven. The chubs were practically all L. hoyi, especially in the shallow tows. Ordinarily the trawl caught little other than chubs, but at 20 fathoms off St. Joseph, 127 pounds of alewives were taken; and at 50 fathoms off Grand Haven the net brought up 49 pounds of fourhorn sculpins. The catch of sculpins was the smallest by far for this area in several cruises.

Hydrographic observations and collections were made at regular 25-fathom stations off Grand Haven and St. Joseph. Recorded surface-water temperatures ranged from 47.5° F. to 62.2° F. The epilimnion continued to thicken, but a distinct thermocline remained in the deeper water.

M/V "Cisco" Cruise 10: Bad weather reduced materially the work planned for

this cruise. Scheduled trawling, gill-netting, and hydrographic work on the west side of the lake (off Racine and Milwaukee, Wis.) were cancelled altogether; operations were confined to the Grand Haven, Mich., area.

A 52-foot balloon trawl of the type used by most Lake Michigan commercial fishermen was fished at 5-fathom-depth intervals from 10 to 50 fathoms. All tows were for 30 minutes. Most chub catches were rather small, but a large catch (954 pounds) was made at 20 fathoms. In addition, some spottail shiners were caught at 20 fathoms, a few emerald shiners were taken at 15 fathoms, and small numbers of slimy sculpins were caught in all tows deeper than 25 fathoms.

A gang of nylon gill nets (50 feet each of $1\frac{1}{4}$- and $1\frac{1}{2}$-, 100 feet of 2-, and 300 feet each of $2\frac{3}{8}$ -, $2\frac{1}{2}$-, $2\frac{3}{4}$-, 3-, $3\frac{1}{2}$-, and 4-inch mesh) was set overnight at 50 fathoms. The catch was rather light: 322 L. hoyi, 1 Leucichthys alpenae, 5 L. zenithicus, 5 L. kiyi, 2 lake herring, and 3 alewives.

Gangs of linen gill nets were set for 5 nights at 25 fathoms (255 feet each of $2\frac{3}{8}$-, $2\frac{1}{2}$-, $2\frac{5}{8}$ -, $2\frac{3}{4}$-, and 3-inch mesh) and at 50 fathoms (510 feet of each of the above mesh sizes). The nets were out during a southwesterly gale, and the gang at 25 fathoms became so fouled with weeds and other trash that the catch data from it could not be used. The 50-fathom gang, however, apparently fished well throughout the 5 nights. It caught more L. hoyi, but fewer other chubs that an identical gang set in the same place on about the same date in 1954.

By the end of the cruise, 3 species of chubs (L. kiyi, L. alpenae, L. zenithicus) and the lake herring were nearing spawning condition. A few L. kiyi and lake herring were ripe, and one female lake herring had spawned. Spawn from 1 pair of L. kiyi was collected. The fish from these eggs are to be reared in the Northville, Mich., hatchery for taxonomic studies.

Hydrographic collections and observations were made at the regular 25-fathom station off Grand Haven. Surface-water temperatures were about 52° F. at the beginning of the cruise and about 49° F. at the end. By the end of the cruise the water had become vertically homothermous out to a depth of about 30 fathoms, but fairly pronounced stratification remained in depths greater than this.

Note: Also see Commercial Fisheries Review, Dec. 1960 p. 34.

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ABUNDANCE OF SPAWNING LAKE TROUT IN WESTERN LAKE SUPERIOR STUDIED:

M/V "Siscowet" Cruise 8: This cruise was scheduled (October 19-25, 1960) for the U. S. Bureau of Commercial Fisheries research vessel Siscowet to assess the abundance of spawning lake trout in the Apostle Island region of Lake Superior. Large-mesh gill nets (5- to 6-inch mesh stretched measure) were set on two known spawning reefs: Devil's Island Shoal, located one mile east of Devil's Island, and Sand Cut Reef, located between Madeline Island and Chequamegon Point. Two sets were made on Devil's Island Shoal and one set on Sand Cut Reef.

At Devil's Island Shoal approximately 14,000 feet of large-mesh nets were set at depths ranging from 2 to 8 fathoms. Six spawning trout were captured--all of them males 22.6 to 27.2 inches long. The trout were tagged and released.

At Sand Cut Reef 7,000 feet of large-mesh nets were set at depths ranging from 5- to 8-fathoms. No trout were captured in this set.

Two small-mesh nets ($1\frac{1}{2}$- and $2\frac{1}{2}$-inch mesh) were attached to each gang of large-mesh net to sample other species on the lake trout spawning grounds. At Devil's Island Shoal the catch in the small-mesh nets consisted of 72 longnose suckers, 41 lake herring, 40 menominee whitefish, and 5 lake northern chubs.

At Sand Cut Reef the small-mesh nets captured only 7 lake herring, 1 menominee whitefish, and 1 smelt. The large-mesh nets, however, took 7 yellow pike (average weight: 6.5 pounds) and 15 white suckers.

The Wisconsin Conservation Department attempted to take lake trout spawn at Gull Island Shoal, Oak Island Shoal, Cat Island Shoal, and Manitu Island Shoal. They fished 61,000 feet of large-mesh nets and captured 21 spawning trout. Only 4 of these were females. About 1 quart of eggs was taken.

Trawls were towed by the Siscowet just south of Stockton Island in an effort to cap-

ture young-of-the-year of various species. The ninespine sticklebacks and slimy muddlers predominated in the catches. No young-of-the-year fish were taken.

Water temperatures were the same from the surface to the bottom on the spawning reefs. Temperatures varied from 47.9° F. on Devil's Island Shoal to 50.4° F. at Sand Cut Reef.

Note: Also see Commercial Fisheries Review, Dec. 1960 p 34.

Groundfish

STUDY COMPARES FISHING COSTS IN NEW ENGLAND AND CANADIAN INDUSTRIES:

The first draft of a study of costs of fishing in the New England and Canadian groundfish industries, being conducted by the Bureau of Business Research, Boston College, under a contract from the U. S. Bureau of Commercial Fisheries, has been sumitted by the College. The study was designed to further analyze causes for the decline of the New England groundfish industry, and to compare the performance of the New England industry with its chief competitor, the groundfish industry of the Canadian Atlantic Provinces. Emphasis has been given to costs and earnings in the industry. In addition to the cost analysis, the study covered basic principles and theoretical economic aspects of the operations of the domestic industry. Suggestions are given concerning a more rational economic approach to the operations of the domestic industry.

The report points out that the New England groundfish fleet is comprised of a dissimilar group of vessels engaged in separate and distinct fisheries. Some of the significant observations concerning the operation of this fleet bear on costs and revenues. Vessels are generally becoming old and are not being replaced. This, incidentally, is paralleled with an aging population of fishermen. Few young men are entering the fishery. The older vessels are more costly to operate. Trip expenses have been increasing substantially and are difficult to adjust because of rigid, inflexible items of cost. Revenues, on the other hand, have been on a general down trend.

The Bureau of Commercial Fisheries expects to publish the report for general distribution early in the spring of 1961. The study was financed by funds made available through the Saltonstall-Kennedy Act of 1954.

Gulf Exploratory Fishery Program

EXPLORATORY FISHING FOR INDUSTRIAL FISH CONTINUED:

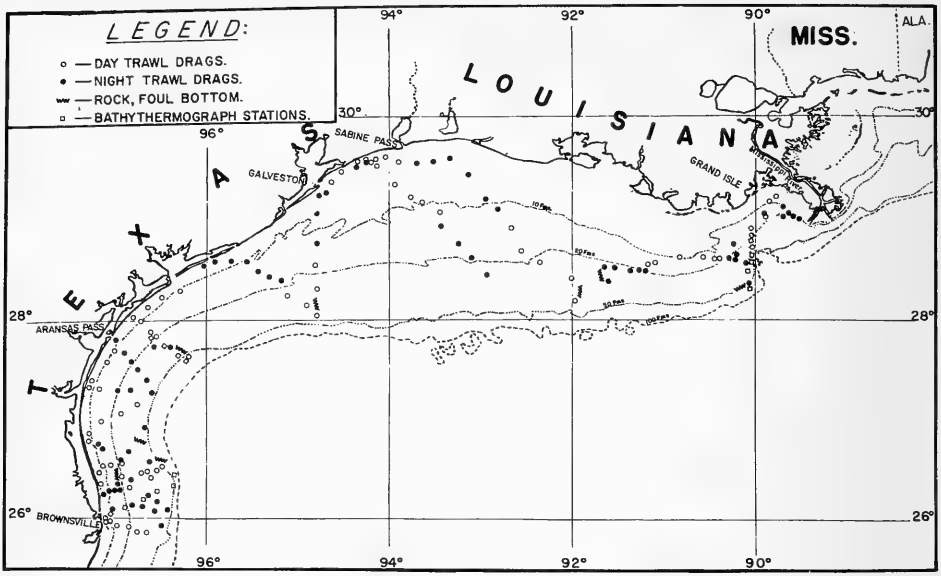
M/V "Oregon" Cruise 71: During October 4-28, 1960, the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon continued exploratory trawling operations on the continental shelf areas off the Louisiana and Texas coasts to obtain additional information on the seasonal occurrence and availability of industrial fish stocks. A total of 141 drags was completed in the 3- to 50-fathom depth range between the Mississippi Delta and Brownsville, Tex. Trawling operations and echo-sounding transects were conducted on a round-the-clock basis.

Commercial concentrations of industrial fish were found to exist between Ship Shoal and the Mississippi Delta in the 10- to 20-fathom depth range and in 5- to 7-fathoms on the north side of Sabine Bank. Individual drags in those areas produced from 2,000 to 6,000 pounds of fish per 1-hour drag with croakers (Micropogon sp.) predominating. Catches from west of Sabine Pass to Brownsville, Tex., however, were generally poor. The best drag in this area produced only 800 pounds of mixed fish. Bottom conditions were generally suitable for trawling with the exception of scattered areas of broken and foul bottom.

A pronounced decline was noted in the abundance of industrial fish between Sabine Pass and Aransas Pass during this cruise compared with the August 1960 cruise.

Approximately 1,000 pounds of the three species of Gulf of Mexico commercial shrimp (heads off) were taken. Brown shrimp (Penaeus aztecus) were the most abundant with best production between the 20- and 40-fathom curves.

Paper-shell scallops (Amusium sp.) measuring 2-3 inches in diameter were taken in moderate quantity (up to 1 bushel) in the 30- to 50-fathom depth range off Grand Isle, La., and Brownsville, Tex.



M/V Oregon Cruise No. 71 (October 4-28, 1960)

Bathythermograph casts were made and surface water salinities obtained on the three oceanographic transects. On each transect observations were made from the 50-fathom curve shoreward at 10-fathom intervals.

Standard "Gulf of Mexico"- and "New England" -type industrial fish trawls, hung 71/85 feet and 60/80 feet, respectively, along the head and footrope, were used. Both types were constructed from 2-inch stretched mesh cotton webbing. Forty-foot 2-seam balloon trawls and 65-foot flat trawls were used in areas where doubt existed as to bottom conditions. Wooden chain doors (10x3 feet) and aluminum bracket doors (6x3 feet) were used to spread the trawls.

An electromagnetic underwater log system was tested and proved extremely accurate in registering the vessel's speed through the water. Preliminary trials with this device indicated a wide range in optimum dragging speeds for the different rigs used.

Note: Also see Commercial Fisheries Review, Dec. 1960 p. 36.

Maine Sardines

CANNED MAINE SARDINE STOCKS, NOVEMBER 1, 1960:

Distributors' stocks of Maine sardines totaled 277,000 actual cases on November 1, 1960--19,000 cases (6 percent) less than the 296,000 cases on hand November 1, 1959.

Canners' stocks on November 1, 1960, totaled 1,258,000 standard cases (100 3/4-oz. cans), an increase of 257,000 cases (26 percent) as compared with November 1, 1959.

The 1960 pack (from the season which opened on April 15, 1960, and ended on December 1, 1960) was about 1,975,000 cases as compared with 1,750,000 cases in 1959.

At the beginning of the 1960 packing season on April 15, 1960, the carryover in the hands of canners from the 1959 pack was 335,000 cases. This carryover plus the 1960

Table 1 - Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, November 1, 1960, With Comparisons1/

Type	Unit	1960/61 Season	1959/60 Season					1958/59 Season			
		11/1/60	7/1/60	6/1/60	4/1/60	1/1/60	11/1/59	7/1/59	6/1/59	4/1/59	1/1/59
Distributors	1,000 actual cases	277	172	197	252	235	296	176	197	254	268
Canners	1,000 std. cases2/	1,258	359	235	397	843	1,001	422	272	474	891

1/Table represents marketing season from November 1-October 31.
2/100 3¾-oz. cans equal one standard case.
Correction: Heading of last 5 columns of Table 1 which appeared under this section on p. 24 of the September 1960 issue of this Review should have read "1958/59 Season" instead of "1957/58 Season." The columns headed "11/1/60" should have read "11/1/59."

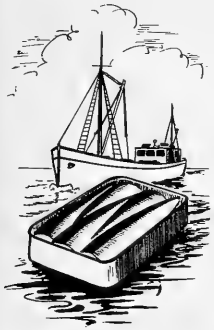
pack of 1,948,000 cases as of November 1, 1960, made the available supply as of that date 2,283,000 cases--slightly more than the available supply of 2,121,000 cases on November 1, 1959. Shipments from November 1, 1959, to November 1, 1960, totaled 1,025,000 cases as compared to 1,120,000 cases for the previous period.

* * * * *

CANNING SEASON ENDS:

The 1960 Maine sardine canning season officially closed on December 1, with a pack of approximately 1,975,000 cases. This is well above last year's production of 1,750,000 cases which was below normal due to a scarcity of fish.

The Maine Sardine Council's Executive Secretary said that 31 plants, located from Portland to Robbinston, were in operation for most of the season which got under way on June 1.



Several thousand persons were employed in canning the pack, which would have a market value of about $18 million.

Fishing in the Portland area was very spotty which limited production there while the eastern Washington County section had the best catch of fish in a number of years, and conditions in the middle section of the coast were about normal.

"Market conditions are good and the industry should have no trouble disposing of the pack," the Executive Secretary stated.

Marketing

EDIBLE FISHERY PRODUCTS MARKETING PROSPECTS, WINTER 1960/61:

United States civilian per capita consumption of food fishery products during the winter 1960/61 may be a little lower than a year earlier. Supplies of the canned items are expected to be about the same, but those of frozen products may be a little less plentiful. Retail prices of foods in this group probably will average moderately higher.

Total supplies of edible fish and shellfish through the winter may not be greater than a year earlier. For the fresh and frozen items, stocks were somewhat lower at the beginning of the fall of 1960 as compared with the same period in 1959, commercial landings will be at the seasonal low point of the year, and any increase in imports may not be large enough to close the gap in domestic supplies between this winter and last. Supplies of canned red salmon will be noticeably larger than a year earlier. About as much canned tuna will likely be available as in the past year. Canned Maine sardines will be a little more plentiful this marketing year.

Exports of edible fishery products in winter 1960/61 may total no larger than in the same period of 1959/60. However, there may be some increase for canned red salmon because of larger supplies this marketing season.

This analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture, in cooperation with the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in the former agency's November 1960 release of The National Food Situation (NFS-94).

North Atlantic Fisheries

Exploration and Gear Research

BOOTHBAY HARBOR EXPLORATORY FISHING ACTIVITIES SHIFTED TO GLOUCESTER:

Exploratory fishing and gear research activities of the U. S. Bureau of Commercial Fisheries, formerly based at Boothbay Harbor, Me., have been combined with the Exploratory Fishing and Gear Research Base in Gloucester, Mass.

The move was made to eliminate duplication of administrative effort and to promote efficiency.

Among the accomplishments of the Boothbay Harbor exploratory fishing and gear research unit were the introduction of the power-block method of handling stop-seine gear and the development of the air-bubble curtain which has proven valuable as a unique method for harvesting schools of herring beyond the range of conventional stop-seines and weirs.

Experiments in electro-fishing for herring, which were started in the summer of 1960, will be resumed early in the 1961 fishing season.

* * * * *

NEW EXPLORATORY FISHING AND GEAR RESEARCH CHIEF APPOINTED:

The Director of the North and Middle Atlantic Region of the U. S. Bureau of Commercial Fisheries has announced the appointment of Keith A. Smith as Director of the North Atlantic Fisheries Exploration and Gear Research Base at Gloucester, Mass., to succeed James L. Squire, Jr., who recently transferred to the U. S. Bureau of Sport Fisheries and Wildlife for a Southern California assignment.

Smith joined the Fish and Wildlife Service as soon as he received his B. S. degree in Fisheries from the University of Washington in 1952. His first assignment was with the Bureau's Seattle office where he conducted exploratory fishing in Alaskan and North Pacific waters for Alaskan shrimp, Pacific tuna, and bottom fish.

He transferred to Boothbay Harbor, Me., in 1955 where he has served as Chief of Maine Herring Exploration and Gear Research. Notable among his unit's accomplishments in behalf of the Maine Sardine industry was the development of a novel method of harvesting herring by closing in on them with a barrier curtain of air bubbles.

North Atlantic Fisheries Investigations

GULF OF MAINE SURVEYED FOR YOUNG HADDOCK AND OTHER SPECIES:

M/V "Delaware" Cruise 60-12: During a 20-day cruise the U. S. Bureau of Commercial Fisheries research vessel Delaware surveyed the Gulf of Maine for (1) the distribution and abundance of haddock spawned in the spring of 1960, and (2) the distribution and abundance of other species found in the Gulf of Maine.

U. S. Bureau of Commercial Fisheries research vessel Delaware.

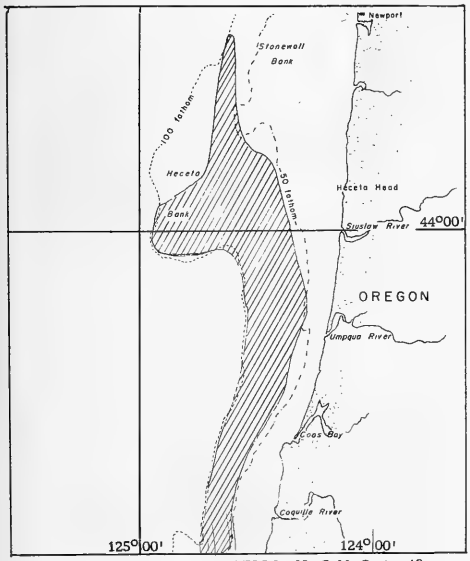
North Pacific Exploratory Fishery Program

GOOD SHRIMP FISHING GROUNDS FOUND OFF CENTRAL OREGON:

M/V "John N. Cobb" Cruise 48: The U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb returned to Seattle, November 3, 1960, completing 6 weeks of exploratory shrimp fishing in cooperation with the Oregon Fish Commission. The survey was conducted off central Oregon, in the general region between the Coquille River and Stonewall Bank.

Systematic surveys of the bottom with a high-resolution, low-frequency echo-sounder resulted in the discovery of some fishable ground of soft bottom located within rocky regions avoided by commercial fishermen. Test drags made with a Gulf-of-Mexico shrimp trawl on the soft-bottom areas produced some catches of pink shrimp in commercial quantity. The best drag of the cruise, made off the Umpqua River in 90 fathoms of water, yielded 650 pounds of pink shrimp in one-half hour of fishing. A number of other one-half hour drags produced from 200 to 500 pounds of shrimp. The exploratory catches were generally higher than those concurrently made by commercial shrimp fishermen on previously known grounds in the same general region.

Maximum concentrations of shrimp were found at depths from 85 to 95 fathoms on green mud bottom, with good catches also in water as shallow as 72 fathoms. Test drags were made within the depth range from 50 to 110 fathoms.



Area of shrimp explorations M/V John N. Cobb Cruise 48 (October-November 1960).

The size of the shrimp varied within the region, ranging from 70 to 140 heads-on count per pound. Samples of the catches showed that two- and three-year-old shrimp were dominant, with a few one- and four-year-olds also present.

The procedure used to survey the areas was as follows: (1) Sounding transects were made with a high-resolution, low-frequency echo-sounder. (2) On the grounds indicated by the echo-sounder as being free of snags and having a soft bottom, a series of drags from shallow to deep water were made until the center of abundance of the shrimp was located. This contour was then followed up and down the coast, when possible, until shrimp were no longer taken. Drags were then made again from shallow to deep water to insure that the center of abundance of the shrimp had not shifted. (3) Samples of shrimp from each drag were measured and sexed and the heads-on count per pound determined. Length frequencies of the more important species of fish caught were also obtained from each area explored.

Oregon

NEW FISH LADDERS RECOMMENDED AT WILLAMETTE FALLS:

Construction of two new ladders and other fish-protecting facilities at Willamette Falls near Oregon City, Oreg., has been recommended by the Oregon Fish Commission following an intensive and detailed two-year survey by technical engineering consultants.

"Determination of practical fish facilities as are now recommended for Willamette Falls, which will satisfy both engineering and biological requirements, is an important step toward eventual solution of this perennial fish passage problem," the Commission Chairman said in commenting on the report.

Early estimates indicate that the cost of the project would approximate $3.4 million. Funds for the survey were provided by the U. S. Bureau of Commercial Fisheries. The findings have been forwarded to the Bureau for study. The problems of legal responsibility, the source of funding for construction, and obtaining the necessary quantities of water for the facilities remain to be decided.

"Removal of these obstructions to fish passage," the State Fisheries Director said, "is one of the major factors in developing the fisheries potential which exists for salmonids in the Willamette River system and would be of particular advantage for establishing populations of fall chinook and silver salmon."

Willamette Falls is on the main stem of the Willamette River, approximately 26 miles above its confluence with the Columbia River. The development of hydroelectric power combined with the regulation of flow by headwater reservoirs present difficult fish passage problems to anadromous fish. These are important factors in limiting the magnitude of the annual fish runs and the resultant loss in crops that could be harvested from them by both sport and commercial fishermen.

Fish ladders are a series of adjoining pools to help fish get past dams or falls.

First priority consideration of the fish facilities recommended will be a ladder having its entrance in the dead-ended large bay on the west side of the river immediately below the point where turbine water from two corporations is discharged and fish are attracted into the common tailrace or "cul-de-sac." At the present time the only route for the upstream passage of fish is an inadequate ladder located on the west side of the center of the U-shaped falls and dam about 500 feet upstream from the "cul-de-sac."

A second ladder at the main falls which would provide passage over a wide range of forebay and tailwater fluctuations is part of the plan. This would replace the existing ladder. It is possible that solution of the two aforementioned fish passage problem areas may alter the necessity for the relatively minor problems elsewhere in the project.

Both commercial and personal-use fishermen want the population of salmon and other anadromous fish increased in this major river as well as in its snow-fed tributaries which provide ideal areas for natural propagation of salmon and steelhead trout.

The most important existing fish population of the Willamette River is the spring-chinook salmon run. The term "spring" comes from the fact that the adult fish in their upstream migration enter the river and pass Willamette Falls during the spring months, remain for the summer in the various tributaries, and spawn in the fall. It is during the initial spring migration when these fish are subjected to a very intensive sport fishery in the several miles of river below Willamette Falls. In addition to being the most abundant and most heavily fished, the spring chinook are considered to be the best in quality of all the salmon.

Although spring chinook spawn in the Clackamas River, which joins the Willamette below the falls, the great bulk of the run must pass the falls to reach the spawning grounds in several tributaries that have their sources in the Cascade Mountains on the east side of the valley.

Also important among fish populations is the steelhead trout which pass Willamette Falls during late winter and early spring and support an important sport fishery, particularly in the tributaries.

With abatement of pollution and improvement in fish passage, the river above the falls appears to be capable of supporting important runs of fall chinook and silver salmon.

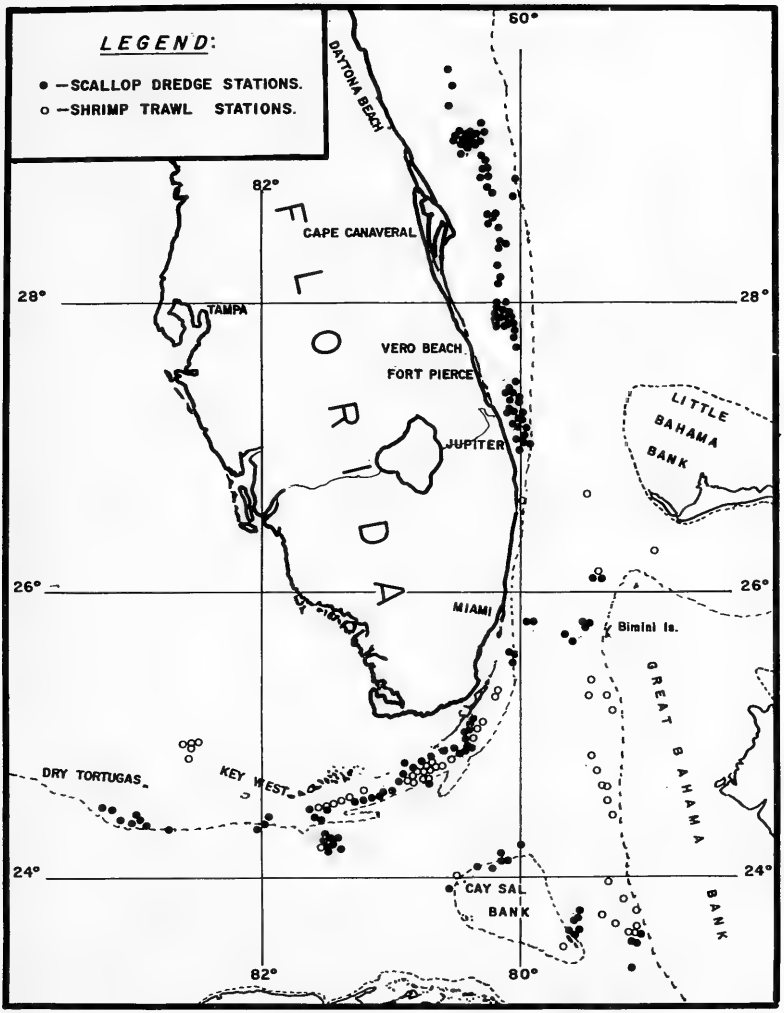
The author of the report said that the maximum utilization of the Willamette River system by these several species and races of adromous fish requires that efficient fish passage at Williamette Falls be accomplished throughout the year and at all river stages.

South Atlantic Exploratory Fishery Program

EXTENSIVE SURVEY MADE OFF FLORIDA EAST COAST FOR STOCKS OF SHRIMP AND SCALLOPS:

M/V "Silver Bay" Cruise 26: A 38-day (ended November 16, 1960) exploratory fishing cruise was made along the continental shelf and slope areas off the Florida east coast, in the Straits of Florida, and on the western edge of Great Bahama Bank, by U. S. Bureau of Commercial Fisheries chartered fishing vessel Silver Bay. Forty-foot shrimp trawls, eight-foot and ten-foot modified Georges Bank scallop dredges, and a six-foot tumbler dredge were utilized at 238 stations to assess the shrimp and scallop potential of the areas.

Catches of live scallops (Pecten gibbus) ranged up to 17 bushels per one-half hour



M/V Silver Bay Cruise 26 (October-11-November-15, 1960).

drag with a single dredge in the 13- to 49-fathom depth range between Daytona Beach and Bethel Shoal, Fla. Meat yields averaged $6\frac{1}{2}$ pints per 75-pound bushel. Nineteen tows between Jupiter Inlet and Ft. Pierce, Fla., in the 14- to 40-fathom depth range resulted in catches varying from zero to one-half bushel per 30-minute drag.

Sixty-four observers participated in three days of scallop-fishing demonstrations conducted out of Ft. Pierce. Five hours of actual fishing time in the demonstration area ($27^{o}53'$ N. latitude, $80^{o}10'$ W. longitude) produced 101.5 bushels of live scallops. An industry-developed mechanical meat and viscera "separator" was successfully tested aboard the vessel.

Extensive shrimp-trawling and scallop-dredging operations were conducted between Miami and Key West. Shrimp catches ranged up to 11 pounds of 40- to 50-count pink shrimp (Penaeus duorarum) in 40 to 60 fathoms and 5 pounds of large brown shrimp (Penaeus aztecus) in 50 to 60 fathoms southwest of Alligator Reef. Thirty pounds of Caridean shrimp were taken along with 15 individual royal-red shrimp (Hymenopenaeus robustus) in 325 fathoms south southeast of American Shoal. No live calico scallops were taken during dredging operations in this area.

Calico scallops dredged from new bed discovered off Florida's east coast. Shells are 2 to 2.5 inches in size, yielding 4 to 5 pints of meats per 80-pound bushel.

A number of species of Penaeid and Caridean shrimp were caught off the western edge of the Great Bahama Bank in depths ranging from 125 to 290 fathoms. Surprising depth records were obtained for the commercially-important Penaeus duorarum, P. brasilienis, and P. schmitti (pink shrimp, and Caribbean brown and white shrimp, respectively), when catches of 1 to 8 pounds were made in depths of 150 to 200 fathoms. Scattered individual royal-red shrimp and P. megalops were caught in a few drags at 250 to 300 fathoms. Heavy deposits of decaying vegetation, apparently washed down off the Bahama Bank, blanketed the bottom out to depths of 250 fathoms, and greatly hampered gear efficiency throughout the area.

Sponges

COLOR FILM ON NATURAL SPONGE INDUSTRY:

Old world methods and old world culture add color and zest to Sponge--Treasure from the Sea, a 14-minute, 16-mm. sound-color film produced by the Fish and Wildlife Service, the U. S. Department of the Interior announced on December 8, 1960.

The film tells the story of the natural sponge industry in the United States. The

Fig. 1 - Sponge diver ready to submerge in Gulf of Mexico off the west coast of Florida. Mesh bag is used to store sponges while harvesting the sponges on the seabed.

center of this industry is Tarpon Springs on the west coast of Florida. Sponsor of the film is the Sponge and Chamois Institute, and the producer and distributor of the film is the Fish and Wildlife Service's Bureau of Commercial Fisheries.

The premiere of the film will be in Tarpon Springs, Fla., December 10, at the annual meeting of the Sponge and Chamois Institute. Prints will be available from the Bureau's cooperating film libraries throughout the country on a free loan basis and from the Visual Education Unit, Bureau of Commercial Fisheries, U. S. Department of the Interior, Post Office Box 128, College Park, Md.

Fig 2 - Sponges being hung for drying aboard a vessel operating out of Tarpon Springs.

There are two locales for the picture--Tarpon Springs and the Miami Seaquarium. The Seaquarium was used to film the underwater sequence of the picture.

One of the high spots of the picture shows the two methods of harvesting sponges, hooking and "hard hat" diving; another, the sponge auction where silence and gesture replace the usual chant of the auctioneer and the shouts of the bidders; a third, the "Blessing of the Waters" on Epiphany Day with its ancient custom of diving for the Golden Cross. Old world music and old world dancing are included at appropriate places.

Sponge harvesting is a Greek art with centuries of tradition as a background. It was brought to this country more than a hundred years ago by Greek sponge fishermen and it has been maintained by their progeny throughout the decades.

Sponge harvesting has defied skin-diving techniques. Any harvesting which cannot be done by hooking from the surface must be done by men in the full diving suit with the hardshell headpiece, breathing hose and leaded feet, belt and breast weights. Some sponges are deep, and the surrounding waters--surface temperatures not withstanding--are cold. At times there are tides and currents which make the heavy suit and haul lines necessary. Then there is the length of time the diver is on the bottom.

The demand for natural sponges continues because man may imitate but has never duplicated the natural sponge which--besides having a multitude of uses in the home--is indispensable in lithography, ceramics, and other industries.

Tuna

CORE-SAMPLING TECHNIQUE FOR RAW TUNA:

A core-sampling technique has been worked out to obtain representative samples of tuna meat during the various processing stages. The researchers wanted to obtain samples of the fish without mutilating the entire fish and thus rendering it unfit for canning.

Core sampling provides a method of removing small portions of raw tuna meat from desired locations on the fish. The sample can be taken to avoid bone or dark meat, and to obtain meat that is representative of the light meat that will end up in the can.

Bureau technologists designed a series of experiments to determine whether or not a simple core sampler could be used to produce sufficiently homogeneous samples to give reliable results when they were analyzed for such components as moisture, protein, fat, ash, sodium, and potassium, or tested for freshness by means of total volatile base free fatty acid, and thiobarbituric acid tests.

The use of four $\frac{3}{4}$-inch cores from specific sections of each fish gave samples that were homogeneous with respect to protein and moisture content and probably reasonably homogeneous with respect to the other components and to the quality tests that are not associated with the oil of the tuna. The re-

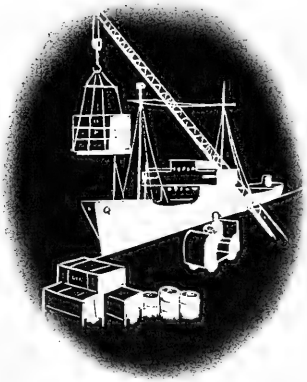
searchers do not recommend the core-sampling method for use in preparing samples for rancidity tests such as the thiobarbituric acid method.

United States Fishery Landings

COMMERCIAL LANDINGS FOR 1960 EXPECTED TO EQUAL 5-YEAR AVERAGE:

The 1960 commercial fishery catch for the United States was expected to equal the five-year average, but will be about 200 million pounds below the 1959 mark of 5.1 billion pounds. The peak year was 1956 with 5.2 billion pounds.

The estimate of the 1960 catch was based upon data available for the first nine months of the year and an estimate of the fishing pattern and results for the remaining three months.



For the second consecutive year, the catch of fish used for industrial purposes--fish oil, meal, and animal feed--exceeded that taken for human food. This condition prevailed despite the fact that the industrial catch was expected to be 200 to 250 million pounds below that of 1959 and the catch for human consumption up 30 to 50 million pounds.

The total catch of fish for the first nine months was 3.6 billion pounds as compared with 3.7 billion pounds for the same period in 1959. The 1960 decline in the industrial catch was reflected in the catches of menhad herring in Alaska, and in miscellaneous indu trial fish in New England. Increases in the harvest of food fish species were noted in Alaska salmon (203 million pounds compare with 147 million pounds). Maine sardines (131 million compared to 102 million), jack mackerel in California (50 million compared to 18 million), shrimp in the South Atlantic States and Gulf of Mexico (162 million compared to 151 million), and ocean perch (117 million compared to 110 million). Slight decreases occurred during the first nine months of 1960 in the catch of cod, halibut, tuna, whiting, and Washington State salmon.

* * * * *

JANUARY-SEPTEMBER 1960:

Landings of fish and shellfish in the United States during the first nine months of 1960 amounted to 3.6 billion pounds--about 4 percent less than during the comparable period of 1959.

Shrimp fishing trawler operating out of Florida ports.

The decline resulted from reduced landings of fish used for industrial purposes. The catch of those fish in Maine and Massachusetts was down 49 million pounds, menhaden production was down over 82 million pounds and Alaska herring 51 million pounds. The only major items of food fish showing sharp declines in catch were whiting, down 14 million pounds, and salmon in Washington, down 13 million pounds.

Large increases occurred in the 1960 catch of Alaska salmon which totaled 203 million pounds--56 million pounds more than in 1959. Also taken in greater volume during the first nine months of 1960 were jack mackerel (up 32 million pounds), Maine

Table 1 - United States Fishery Landings of Certain Species for Periods Shown, 1960 and 1959

Species	Period	1960 1/	1959	Total 1959
		(1,000 lbs.)		
Anchovies, Calif.	9 mos.	2,700	2,192	7,174
Cod:				
Maine	9 mos.	2,600	2,412	2,694
Boston 2/	9 "	12,000	14,708	17,709
Gloucester 2/	9 "	2,400	2,443	3,233
Total cod		17,000	19,563	23,636
Haddock:				
Maine	9 mos.	2,900	2,771	3,405
Boston 2/	9 "	62,100	60,771	72,378
Gloucester 2/	9 "	10,000	10,780	12,103
Total haddock		75,000	74,322	87,886
Halibut 3/:				
Alaska	9 mos.	20,800	21,356	22,537
Wash. and Oreg.	9 "	16,100	17,095	17,908
Total halibut		36,900	38,451	40,445
Herring:				
Maine	9 mos.	131,300	101,871	117,150
Alaska (season over)	9 "	56,000	107,444	107,444
Industrial fish, Me. & Mass. 4/	9 mos.	39,500	88,100	103,312
Mackerel:				
Jack	9 mos.	50,200	17,782	37,507
Pacific	9 "	19,500	17,490	37,602
Menhaden	9 "	1,768,700	1,851,113	2,202,732
Ocean perch:				
Maine	9 mos.	62,100	59,104	75,225
Boston	9 "	900	2,311	3,280
Gloucester	9 "	53,700	49,036	58,197
Total ocean perch		116,700	110,451	136,702
Salmon:				
Alaska	9 mos.	203,000	147,278	147,278
Washington	8 "	2/ 11,500	2/ 24,690	42,308
Oregon	8 "	2/ 4,700	2/ 4,318	5,329
Sardines, Pacific	to Nov. 9	47,600	53,300	74,367
Scallops, sea (meats), New Bedford	9 mos.	14,600	14,283	18,814
Shrimp (heads-on):				
South Atlantic & Gulf States	9 mos.	162,200	151,085	219,509
Wash.	8 "	1,600	2,501	3,046
Oreg.	8 "	600	2,414	2,734
Squid, Calif.	9 "	600	15,672	19,653
Tuna, Calif.	to Nov. 5	250,700	254,694	254,738
Whiting:				
Maine	9 mos.	11,100	23,174	23,339
Boston	9 "	400	588	687
Gloucester	9 "	51,700	53,591	61,797
Total whiting		63,200	77,353	85,823
Total all above items		3,073,800	3,176,367	3,775,237
Others not listed		520,700	561,410	1,324,763
Grand total		3,594,500	3,737,777	5,100,000

1/Preliminary. 3/Dressed weight.
2/Landed weight. 4/Excludes menhaden.

Table 2 - United States Fishery Landings by States for Periods Shown, 1960 and 1959

Area	Period	1960 1/	1959	Total 1959
		(1,000 lbs.)		
Maine	9 mos.	243,900	222,328	265,958
Massachusetts 2/:				
Boston	9 mos.	90,400	90,845	113,257
Gloucester	9 "	184,200	196,301	228,723
New Bedford	9 "	80,500	89,714	107,961
Provincetown	9 "	20,700	21,621	27,700
Total Mass.		375,800	398,481	477,641
Rhode Island 3/	9 mos.	31,300	85,089	101,548
New York 3/	9 "	30,900	29,282	39,387
New Jersey 3/	9 "	50,800	43,765	63,404
Maryland 3/	9 "	48,500	48,583	60,847
North Carolina 3/	9 "	42,300	45,517	62,724
South Carolina 3/	9 "	14,100	12,342	19,452
Georgia	9 "	18,200	14,834	21,594
Florida 3/	9 "	103,100	99,421	148,723
Alabama	8 "	7,600	9,831	14,022
Mississippi 3/	7 "	11,200	11,760	78,865
Louisiana 3/	4 "	20,600	21,670	103,018
Texas 3/	8 "	32,300	40,731	92,913
Ohio (season: Mar.-Dec.)	9 "	15,500	16,752	18,586
Alaska:				
Halibut 4/	9 mos.	20,800	21,356	22,537
Herring (season over)	9 "	56,000	107,444	107,444
Salmon	9 "	203,000	147,278	147,278
Washington	8 mos.	72,000	99,392	155,186
Oregon	8 "	32,700	36,921	51,718
California:				
Certain species 5/	9 mos.	371,300	361,130	431,089
Other	6 "	37,200	42,069	82,339
Total Calif.		408,500	403,199	513,428
Hawaii	6 mos.	4,700	7,031	16,570
Rhode Island, Middle Atlantic, Chesapeake, South Atlantic, and Gulf States (menhaden only)	9 mos.	1,750,700	1,815,670	2,166,126
Total all above		3,594,500	3,737,777	4,748,969
Others not listed		6/	6/	351,031
Grand total		6/	6/	5,100,000

1/ Preliminary.
2/ Landed weight.
3/ Excludes menhaden.
4/ Dressed weight.
5/ Includes catch of anchovies, jack and Pacific mackerel, Pacific sardines, squid, and tuna. Data on tuna are for the season through November 5 and on Pacific sardines through November 9.
6/Data not available.

NOTE: Data principally represent weight of fish and shellfish as landed except for mollusks which represent the weight of meats only.

Fig. 2 - Salmon seiner hauling in first half of seine net off San Juan Island, Puget Sound.

herring (up 29 million pounds), ocean perch (up 6 million pounds), and shrimp (up 11 million pounds) in the South Atlantic and Gulf States.

United States Fishing Fleet[1/] Additions

SEPTEMBER 1960:

A total of 21 vessels of 5 net tons and over were issued first documents as fishing craft during September 1960--a decrease of 20 vessels as compared with the same month in 1959. The Chesapeake area led with 8 vessels, followed by the Gulf with 7 vessels, and Alaska with 3. The New England, South Atlantic, and the Pacific areas accounted for 1 each.

Table 1-U. S. Vessels Issued First Documents as Fishing Craft by Areas, September 1960

Area	September		Jan.-Sept.		Total
	1960	1959	1960	1959	1959
	(Number)				
New England	1	2	26	13	15
Middle Atlantic	-	4	12	10	12
Chesapeake	8	9	56	69	106
South Atlantic	1	2	41	69	76
Gulf	7	15	67	117	135
Pacific	1	7	100	84	97
Great Lakes	-	1	12	6	6
Alaska	3	1	21	31	32
Total	21	41	335	399	479

Note: Vessels assigned to the various areas on the basis of their home ports.

During the first nine months of 1960, a total of 335 vessels were issued first documents as fishing craft--64 less than during the same period of 1959. Most of the decline occurred in the Gulf area with a drop of 50 vessels as compared with the 1959 nine-months period.

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft by Tonnage, September 1960

Net Tons	Number
5 to 9	12
10 to 19	7
20 to 29	1
30 to 39	1
Total	21

U. S. Fish Meal and Solubles Production and Imports, January-September 1960

During the first nine months of 1960 the United States production of fish meal amounted to 216,425 short tons, compared with 231,595 tons produced by the same firms during the 1959 nine-months period. A drop of over 5,000 tons occurred in the production of menhaden meal and nearly 4,000 tons in Alaska herring meal as compared with the first nine months of 1959.

Imports of fish meal totaled 97,333 tons in January-September 1960. These imports were nearly 23,000 tons less than in the same period of the previous year. Imports from Peru (over 51,000 tons) made up 52 percent of the total, while Canada followed with the next largest amount (28,000 tons). The remaining 18,000 tons were received from Chile, Union of South Africa, Angola, and other countries.

Similar declines occurred in the domestic production and imports of fish solubles. The January-September 1960 production of fish solubles amounted to 83,002 tons--59,813 tons less than in the same period of 1959. Imports of fish solubles amounted to 2,832 tons, compared with 21,213 tons in the same nine months of 1959.

1/Includes both commercial and sport fishing craft.

Table 1 - U. S. Supply of Fish Meal and Solubles, 1960 and 1959

Item	January-September 1960	January-September 1959	Total 1959
	(Tons)		
Fish Meal:			
Domestic production:			
Menhaden	181,855	186,891	223,893
Tuna and mackerel	16,711	17,233	25,380
Herring, Alaska	4,126	8,094	8,094
Other	13,733	19,377	49,184
Total production	1/216,425	1/231,595	306,551
Imports:			
Canada	27,546	34,057	39,033
Peru	51,093	46,225	49,923
Chile	12,148	4,995	5,104
Angola	360	20,738	20,738
Union of South Africa	5,829	6,011	9,727
Other countries	357	7,897	8,400
Total imports	97,333	119,923	132,925
Available fish meal supply	313,758	351,518	439,476
Fish Solubles (wet weight):			
Domestic production 2/	83,002	142,815	165,359
Imports:			
Canada	809	1,305	1,660
Denmark	1,858	16,109	18,723
Other countries	165	3,799	6,247
Total imports	2,832	21,213	26,630
Available fish solubles supply	85,834	164,028	191,989

1/ Based on reports from firms which accounted for 92 percent of the 1959 production.
2/ Includes production of homogenized-condensed fish.

U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, SEPTEMBER 1960:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during September 1960 decreased by 9.2 percent in quantity and 5.8 percent in value as compared with August 1960. The decrease was due primarily to lower imports of canned salmon and frozen tuna other than albacore and, to a lesser degree, a decrease in the imports of fillets other than groundfish and fresh and frozen salmon. The decrease was partly offset by a 2.9-million-pound increase in the imports of groundfish fillets.

Compared with September 1959, the imports in September this year were down 6.9 percent in quantity, but up slightly (0.1 percent) in value. Imports were down for frozen tuna other than albacore (down 6.4 million pounds), and canned tuna in brine (down 1.9 million pounds). Compensating, in part, for the decreases was an increase of about 1.8 million pounds in the imports of frozen shrimp.

United States Imports and Exports of Edible Fishery Products, September 1960 with Comparisons

Item	QUANTITY			VALUE		
	September		Year	September		Year
	1960	1959	1959	1960	1959	1959
	(Millions of Lbs.)			(Millions of $)		
Imports:						
Fish & shellfish: Fresh, frozen, & processed 1/	88.9	95.5	1,070.5	25.9	25.7	309.6
Exports:						
Fish & shellfish: Processed only 1/ (excluding fresh & frozen)	6.3	7.7	68.0	3.4	3.8	22.8

1/ Includes pastes, sauces, clam chowder and juice, and other specialities.

United States exports of processed fish and shellfish in September 1960 were higher by 176.3 percent in quantity and 126.7 percent in value as compared with August 1960. Compared with September 1959, the exports in September 1960 were lower by 17.8 percent in quantity and 10.5 percent in value. The lower exports in September this year as compared with the same month in 1959 were due primarily to a drop in the exports of California sardines and canned salmon.

* * * * *

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1960 at the 12½-percent rate of duty is 53,448,330 pounds. Any imports in excess of the quota will be dutiable at 25 percent ad valorem.

Imports from January 1-October 29, 1960, amounted to 41,295,078 pounds, according to data compiled by the Bureau of Customs. A total of 43,114,352 pounds had been imported from January 1-October 31, 1959.

* * * * *

IMPORTS AND EXPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-SEPTEMBER 1960:

During the first nine months of 1960, imports of canned tuna, canned sardines not in oil, fresh or frozen lobster, fresh or frozen shrimp, canned oysters, and fresh or frozen sea scallops were larger than during the same period of 1959. Imports of fresh or frozen groundfish, fillets and blocks, salmon, canned crab meat, fish meal, and fish solubles were lower. Fresh or frozen tuna, frozen swordfish, and canned sardines in oil were imported at about the same level as during the first nine months of 1959.

Exports of fish oils, canned mackerel, fresh or frozen salmon, and shrimp were larger than those of January-September 1959. Canned sardines, canned salmon, and canned squid were exported in lesser quantities.

Imports: GROUNDFISH AND OCEAN PERCH FILLETS AND BLOCKS: The most significant trend in groundfish imports during the first nine months of 1960 was the larger share of total imports provided by frozen blocks. During this 1960 period, frozen blocks were 56 percent of all fresh or frozen groundfish imports compared with 39 percent in the same period of 1959. Despite the increased imports of blocks, groundfish imports were down 8 percent owing to a sharp decline in fillet imports, especially cod.

TUNA, FRESH AND FROZEN: During January-September 1960, frozen tuna was imported in the same quantity as during the same period of 1959. Imports of albacore, however, were 50 percent greater; yellowfin and other tuna were down 11 percent. Although other countries are supplying increased quantities of frozen tuna to the United States, Japan still accounted for the major share.

TUNA, CANNED IN BRINE: Imports during January-September 1960 were slightly higher than those of the like period of 1959. A decline in receipts of canned light-meat tuna was more than offset by an increase in canned white-meat tuna.

SHRIMP, MOSTLY FROZEN: Imports in the first nine months of 1960 were slightly higher than in 1959, a year of record imports. Receipts from Mexico and El Salvador were up more than three million pounds; receipts from Japan were 3,690,000 pounds less than those of the like period of 1959.

LOBSTER AND SPINY LOBSTER, FRESH OR FROZEN: Northern lobster imports during January-September 1960 were 7 percent above those for the same period of 1959; spiny lobster imports were up 16 percent. The major shippers were Canada, Australia, and the Union of South Africa.

SALMON, CANNED AND FRESH OR FROZEN: Salmon imports were considerably below those of January-September 1959. Canned salmon imports, primarily from Japan, were 42 percent less; imports of fresh or frozen salmon, nearly all from Canada, were down 30 percent.

CANNED SARDINES: Norway and Portugal, as usual, supplied the major share of the imported canned sardines in oil; the Union of South Africa provided the major share of the canned sardines not in oil. Receipts of canned sardines not in oil were more than five times those imported during all of 1959 when these imports were comparatively low. California pack of canned sardines was light in 1959 and was expected to be lighter in 1960. When this occurs, imports of canned sardines not in oil increase.

CANNED CRAB MEAT AND CANNED OYSTERS: During the first nine months of 1960, imports of canned oysters were up 13 percent over those of the like period of 1959; imports of canned crab meat were down 50 percent. The declining imports of Japanese crab meat were due to more profitable markets elsewhere and added restrictions on Japanese crab fishing in the Sea of Okhotsk area.

SEA SCALLOPS, FRESH OR FROZEN: During January-September 1960, imports from Canada were more than double those of the same period of 1959. Canada accounted for 93 percent of the 1960 imports; Japan supplied nearly all the remainder.

SWORDFISH, FRESH AND FROZEN: Imports of frozen swordfish rose 3 percent; imports of fresh swordfish declined 44 percent from those of the first nine months of 1959. Japan accounted for the major share of the frozen swordfish and Canada for nearly all the fresh swordfish.

FISH MEAL: During January-September 1960, imports were down 19 percent from those of the like period of 1959. Peru accounted for more than half of the receipts. Canada was the second leading supplier. A large gain in imports was noted from Chile; a sharp decline from Angola.

FISH SOLUBLES: Imports were 87 percent below those of January-September 1959. This decline is attributed to low prices for fish solubles in the United States market.

Exports: CANNED SARDINES, NOT IN OIL: During January-September 1960, exports declined 47 percent from the comparable period of 1959. This decrease is the result of a drop of more than 50 percent in shipments to the Philippines. Notwithstanding the recent cutbacks, that country is still the primary export market for this product.

SALMON, CANNED AND FRESH OR FROZEN: Exports of fresh or frozen salmon were nearly three times those of the first nine months of 1959. The increase was due to larger landings of Alaskan salmon and liberalization of import controls by a number of foreign countries. Exports of canned salmon declined 26 percent, mainly due to a reduction in the amount of canned salmon taken by the Philippines. The relatively large exports of canned salmon to the Philippines in 1959 was a departure from the usual United States-Philippine trade in this product during recent years.

SHRIMP, FRESH OR FROZEN AND CANNED: During the first nine months of 1960, exports of fresh or frozen shrimp were up 40 percent; exports of canned shrimp showed a 27 percent increase. Canada took more than half the canned shrimp and nearly three-fourths of the fresh or frozen shrimp.

CANNED SQUID: During January-September 1960, exports were behind those of the same period in 1959. The decline is traceable to restrictions imposed by the Philippines which is the main foreign market for United States canned squid. After a record high level in the first quarter, canned squid exports to the Philippines decreased in the second quarter; none were reported in the third quarter.

FISH OILS: Exports were 4 percent above those of the first nine months of 1959. Exports to Sweden and Norway, in addition to the Netherlands and West Germany, contributed to the increase over the record year of 1959.

Virginia

FISHERIES LABORATORY RECEIVES GRANT TO STUDY CONCENTRATION OF RADIOACTIVE PARTICLES BY MARINE ANIMALS:

In order to study the role of filter-feeding marine organisms (oysters, clams, etc.) in removing radioactive wastes from water and depositing them as bottom sediments, a $20,000 grant has been awarded by the Atomic Energy Commission to the Virginia Fisheries Laboratory. The Laboratory Director stated: "Studies of the concentration of radioactive particles by marine animals and plants are especially needed in Virginia waters, because of the proximity of significant nuclear activities to extensive sport and commercial fisheries, industrial and recreational areas. It should be specifically stated this particular problem is merely one of many pertaining to the over-all marine pollution situation and that this research project is but one of several which is being undertaken by the Laboratory's growing Pollution-Ecology Research Section."

There are several hundred different species of filter-feeding animals in Chesapeake Bay. These include oysters, clams, mussels, copepods, sea squirts, and worms. Of these, the oyster filters the largest volume of water per day per individual. A single market-size oyster will filter about 100 gallons of water through its gills during a 24-hour period... and there are more than 1.6 billion market-size oysters in Virginia waters at a given time. From this we can estimate that more than 165 billion gallons of marine waters are filtered by oysters each day. Oysters are able to remove from the water some particles as large as sand grains, and others as small as bacteria. The undigested material is deposited in the form of compacted pellets on the bottom.

One of the Laboratory's scientists will study the rates at which bio-deposition occurs at different salinities, temperatures, and available food levels. He will also investigate the types of material in the deposits as well as the stability of these deposits on the bottom. This part of the program will yield information on oyster physiology and on the amount of materials likely to be deposited on natural oyster beds.

Another scientist will determine how radioactive ions and particles become associated with natural particles in the water and the rates at which the filter-feeding marine animals can deposit them on the bottom. He will also study the physical and chemical stability of these bio-depositions as related to radioactivity.

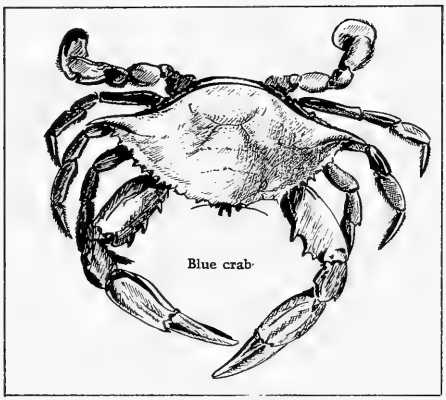
This combined study will help scientists predict what would happen if nuclear wastes should be dumped or if an accident to a reactor should cause an unanticipated release of radioactive materials into tidal waters. If such wastes remain in solution or suspended in the waters, then the normal physical phenomena of dilution and dispersal through tidal action would rapidly lower the concentration; but if they are deposited by living organisms they would remain in man's immediate environment for a longer period of time.

The initial phases of the project are scheduled for completion within one year but the Laboratory plans to continue to work until a better understanding of all aspects of bio-depositions as related to radioactivity are obtained.

* * * * *

LARGE NUMBER OF BLUE CRABS TAGGED IN CHESAPEAKE BAY:

Over 10,000 tagged blue crabs were released in lower Chesapeake Bay by scientists of Virginia's Marine Laboratory during a 7-day period late in November 1960. These crabs were distributed over a large area of the Bay where Virginia vessels began crab dredging December 1.



Blue crab

"This is probably a record number of tagged marine crustaceans--either lobster, crab, or shrimp--released in so short a time," the biologist in charge of the crab research at the Laboratory declared. The reward for the return of each of the numbered red plastic disks that were attached to the crabs is 25 cents.

The biologist, who has been engaged in crab research in Virginia for many years, named three reasons for the study, which was financed entirely out of Laboratory funds.

"One of the objectives is to estimate the total number of crabs in the lower Cheaspeake available to dredges during the winter. In the second place, we want to learn what percent of that number will be removed by dredges in the next four months. There have been wild guesses in the past that anywhere from 1-75 percent are taken, and those who guess the highest percent want to blame dredges for a poor catch the following years."

The third objective is to learn something of the movements of crabs in lower Chesapeake Bay during the winter and spring. For example, whether the crabs along the western shore remain there or whether they move eastward or southward. He also said, "We will probably find out when crabs move from mud to sandy bottoms and what percentage of the stock does so." According to experienced watermen, this movement occurs after a hard freeze in late January or February.

A commercial crab dredging vessel, the Geraldine, was hired by the Laboratory to take a team of six scientists to each of 25 stations in the Bay, located 5 miles apart. Six dredge hauls were taken at each station and all the crabs caught were tagged and released.

Over 800 of the crabs were males, about 10 percent of the catch. "This is the first time we have tagged so large a number of males," the biologist explained, "and we tagged them at this time only because their growth stops in the winter. In the summer adult males continue to grow and may lose their tags, but adult females are fully grown," he added.

At one station only 17 crabs were caught and tagged, but at another almost 1,000 were released. If a crab dredger knew the numbers on the tags released at each station he could tell from a tagged crab whether he was on top of a big stock or a little stock of crabs, but the Laboratory biologists are not letting that secret out until the season is over on April 1, 1961.

The Laboratory forecast over a year ago the arrival of the bumper crop of crabs which Virginia and Maryland crabbers have been catching since late July. According to its latest prediction the catch for the four-months season ending April 1, 1961, will rival that of the year 1955.

In anticipation of a large catch, the Virginia Commission of Fisheries has limited to 20 barrels the number of barrels of crabs that may be caught by a boat in one day, chiefly "for conservation measures and the betterment of the over-all economy of the crab industry."

* * * * *

MARINE LABORATORY EXPANDS RESEARCH PROGRAM:

The Director of the Virginia Fisheries Laboratory, Gloucester Point, announced an expanded program of research which will lead to a better understanding of diseases of oysters and other marine animals. Problems of the production of food organisms vital to the well-being of the various important marine organisms are also under study.

"For many years much time and effort has been spent by scientists to control disease among farm crops and animals, and to increase production through improved diets," the Director pointed out. Only recently has the possibility of scientific control been applied to these same problems affecting the production of marine crops. Two researchers, who have recently joined the Laboratory staff, will contribute much to the understanding of these problems.

One of the researchers, a member of the Laboratory's Pollution-Ecology Research Section, is currently beginning a study of certain important marine animals. The quantitative and qualitative data which he obtains will be used as a check to detect possible changes in the marine environment which may be brought about by man, various pollutants, or engineering projects.

"All of these little known marine animals are part of important food chains supporting

our commercial fisheries," the researcher emphasized. "A change in the numbers and varieties of so-called 'useless' animals warn marine scientists that the natural environment is changing and these changes may have far-reaching effects on commercial species."

The other researcher is associated with the Microbiology-Pathology Research group in studying microorganisms in the marine waters of the State, and is giving special attention to disease-carrying organisms in oysters. Perhaps even more fundamental will be his investigation of microbes to determine their function in producing food at a low level in the food chain. Such food is consumed directly by oysters, clams, larval crabs, and fish.

Washington

KING SALMON EGGS DONATED FOR PLANTING IN JAPANESE RIVERS:

Chinook or king salmon from the State of Washington may be migrating to sea from Japanese streams in the Prefectures of Hokkaido and Iwate in the spring of 1961 as the result of a gift of 100,000 fall chinook salmon eggs from that State to the Japan Salmon Resource Conservation Association.

The chinook eggs, from the State's Green River Hatchery, were shipped by air on November 27, 1960. The eyed eggs were packaged in six cases, weighing around 175 to 200 pounds.

The gift was the result of a visit in 1960 of six members of the Japanese Salmon Resource Conservation Association. The group was impressed by Washington's salmon hatchery system and wanted to try a transplant of chinook salmon in Japanese streams.

The take of fall chinook salmon eggs in Washington hatcheries in 1960 will be between 40 and 50 million, so the gift to Japan will not deplete local stocks.

This is the second time Washington has sent chinook salmon eggs to Japan. In 1959, 100,000 spring chinook eggs from the State's Dungeness Hatchery were sent to Hokkaido in honor of the 80th anniversary of the Japanese salmon hatchery system. The Japanese reported that the spring chinook showed few mortalities in shipment or in hatching out and migrated to sea as vigorous, healthy fingerlings.

Japanese use of the eggs is expected to add to knowledge the Washington Fisheries Department is continually seeking on the transplanting and rearing of salmon in other than home streams.

The chinook eggs shipped in November 1960 were split between the Chitose Hatchery in Hokkaido Prefecture and the Otsuchi Hatchery in Iwate Prefecture.

* * * * *

PLANTINGS OF YOUNG SALMON IN 1960 AT RECORD HIGH:

Many millions of vigorous young salmon have migrated to sea in 1960 from Washington streams or fish farm areas because of a record production achieved by State salmon hatcheries, the Director of the Washington State Department of Fisheries announced on October 31, 1960.

Salmon plants in October 1960 in fish farm areas brought releases in 1960 to an all-time record high of 77,831,621, a culmination of three years of intensive effort to increase salmon production through hatcheries and fish farms. Previous record, set in 1959, was 77,491,127 and in 1958 totaled 71,358,827. In addition, hatchery ponds at the end of October still contained about 13 million young salmon, chiefly silvers, which were to be planted early in 1961.

Salmon plants in 1960 have been made in virtually all salmon streams in the State, as well as in the 22 fish farm areas (both fresh- and salt-water) currently in operation. The great majority of the salmon were reared for varying lengths of time in the State's 22 salmon hatcheries. Long experience and investigations have proved that rearing before release results in larger, hardier fish which have a much better chance of survival than if planted immediately after hatching.

Of the more than 77 million salmon planted to date in 1960, fall chinook was the largest single species, with a total of 55,814,779 fish (51,133,381 fingerling; 41,268 yearling, and 4,640,130 fry). Second largest number was silver salmon, with a total of 11,113,492 (2,654,925 fingerling and 8,458,567 yearling). Plants of chum salmon reached 7,105,630

(6,069,566 fingerling and 1,036,064 fry). A total of 2,250,879 spring chinook were planted (1,935,646 fingerling and 315,233 yearling), and 832,086 pink salmon (823,896 fingerling and 8,190 fry).

* * * * *

SPAWNING SALMON ESCAPEMENT GOOD DESPITE POOR CATCHES:

Despite a poor sport and commercia salmon fishing season in Washington State during 1960, severe curtailment of both sport and commercial fishing allowed comparatively good escapements of salmon to Washington streams, the Director of the Washington State Department of Fisheries stated on October 29, 1960.

Returns of chinook salmon to some hatchery streams in Puget Sound were of record size, with indications hatchery egg takes and natural seeding of streams would be comparable to those of last year, assuring future runs and holding hopes for increases.

Commercial fishermen were cooperative in shortening seasons and fishing time and sports fishermen contributed materially to escapements by voluntarily curtailing their fishing efforts.

The Deschutes River fishway count of chinook salmon hit an all-time record for returning adults, with 10,025 counted at the trap up to October 26, 1960, with the run still in progress. Since the Deschutes was first planted in 1946 more than 51,000 chinook have returned to the stream. In 1960, in addition, silver salmon were returning from fish planted in Capitol Lake in 1957.

The new run of chinook salmon that showed up at the Hoodsport Hatchery on Hood Canal (Finch Creek) reached an all-time high of around 2,700 fish. In addition, there were about 1,000 silver salmon in the hatchery's trapping area.

In northern Puget Sound the Samish Hatchery marked the second largest number of returning chinook and magnitude of egg take in its history. In the Snohomish district the outlook for silver salmon was good, with 1,200 silvers at the Skykomish Hatchery, ahead of both last year and the parent year (1957). Surprising too was the silver run trapped and transported around Sunset Falls. As of October 25, 1960, 3,841 silver salmon had been trapped and hauled around the falls, as compared to a total of 1,561 for all of 1958 (first year of trapping).

An unexpected run of more than 5,000 sockeye salmon made their way through the Lake Union ship canal and spawned in the Cedar River in Maple Valley.

Chinook returns to the Issaquah Hatchery were down, but silvers showed strongly downstream from the station and crowded the holding pond, with a good possibility that the silver egg take there would be of record size.

Chinook salmon returns to the Green River Hatchery on Soos Creek were down in numbers of eggs taken, but not in numbers of fish. Here, as in some other Puget Sound streams, there was an unusually large percentage of three-year-old chinook males. This situation is usually considered an indication of a good run the following year.

From a statewide viewpoint, spawning escapements would probably be down, the Director said. As of the end of October 1960, chinook runs were virtually completed, as were silvers, with chum salmon returns, particularly in the coastal area, still incomplete.

Wholesale Prices, November 1960

WHOLESALE PRICES, NOVEMBER 1960:

The November 1960 wholesale price index for edible fishery products (fresh, frozen, and canned) at 131.5 percent of the 1947-49 average was up 1.6 percent from the preceding month and up 8.9 percent from the same month of 1959. The increase from October to November 1960 was due primarily to higher wholesale prices for fresh and frozen fillets, fresh shrimp, and fresh-water yellow pike. From November 1959 to November 1960 all items in the fishery products wholesale price index were priced higher except for frozen halibut, fresh haddock fillets, and canned Maine sardines.

The index for the drawn, dressed, and whole finfish subgroup in November 1960 declined slightly (0.6 percent) from the preceding month. Lower prices for fresh drawn large haddock (down 6.3 percent), frozen halibut (down 2.2 percent), and fresh-water round whitefish at New York City (down 5.4 percent) were just about offset by higher prices for fresh-water yellow pike at New York City and drawn whitefish at Chicago. However, from November 1959 to November 1960, the subgroup's index rose 12.4 percent due to higher prices

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, November 1960 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($) Nov. 1960	Avg. Prices 1/ ($) Oct. 1960	Indexes (1947-49=100) Nov. 1960	Oct. 1960	Sept. 1960	Nov. 1959
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					131.5	129.4	128.1	120.7
Fresh & Frozen Fishery Products:					146.9	143.7	143.7	133.4
Drawn, Dressed, or Whole Finfish:					165.4	166.4	169.8	147.2
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.13	.14	132.6	141.5	120.4	129.2
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.30	.31	92.3	94.4	95.4	95.9
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.90	.90	202.2	202.2	210.6	168.5
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.75	.74	185.9	183.5	183.5	179.7
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.70	.74	141.6	149.7	202.3	126.4
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.70	.58	164.1	134.8	179.4	164.2
Processed, Fresh (Fish & Shellfish):					141.7	135.3	137.0	134.0
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.41	.31	139.5	103.8	108.9	153.1
Shrimp, lge. (26-30 count), headless, fresh.	New York	lb.	.70	.65	109.8	102.7	114.1	102.7
Oysters, shucked, standards	Norfolk	gal.	7.50	7.50	185.6	185.6	173.2	173.2
Processed, Frozen (Fish & Shellfish):					119.6	115.7	110.1	106.4
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.39	103.4	102.1	100.8	98.8
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.34	.29	106.7	91.0	87.9	99.7
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.30	.28	118.8	112.8	108.7	108.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.74	.74	114.2	114.2	106.5	96.4
Canned Fishery Products:					110.1	109.6	106.5	103.4
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	27.50	27.00	143.5	140.9	133.0	127.8
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.10	11.10	80.0	80.0	80.0	77.9
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.65	7.75	89.8	91.0	89.8	88.1
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.50	8.75	90.5	93.1	93.1	93.1

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

for whitefish at New York and Chicago, frozen troll king salmon (up 20 percent), and fresh drawn haddock at Boston (up 2.6 percent). But a drop of 3.8 percent in the frozen halibut prices at New York City partially offset the higher prices for the other subgroup items mentioned.

The November 1960 fresh processed fish and shellfish subgroup index rose 4.7 percent from October 1960. This rise was due to higher prices for fresh small haddock fillets at Boston (up 34.4 percent or about 10 cents a pound) and fresh shrimp at New York City (up 6.9 percent). Prices for fresh shucked oysters at Norfolk remained unchanged. From November a year ago to November 1960 the subgroup index rose 5.7 percent. Higher prices for fresh shrimp (up 6.9 percent) and fresh shucked oysters (up 7.2 percent) more than offset a drop of 8.9 percent for fresh haddock fillet prices.

The index for the frozen processed fish and shellfish subgroup increased 3.4 percent from mid-October to mid-November 1960. All the frozen fillet items were higher in November 1960 as compared with October 1960. Frozen haddock fillet prices rose sharply (17.3 percent or about 5 cents a pound) during that period. In November 1960, most East Coast frozen fillets were less plentiful and this contributed to a stronger market. November 1960 frozen shrimp prices at Chicago were unchanged from October. From November 1959 to November 1960, the subgroup's index was up 12.4 percent due mainly to higher frozen shrimp prices (up 18.5 percent) at Chicago and smaller increases in the wholesale prices for frozen fillets.

The canned fish primary price index increased slightly (0.5 percent) from October to November 1960. A further increase of 50 cents a case for canned pink salmon (due to scarce supplies) was partially offset by a price drop of 1.3 percent for California sardines and 2.8 percent (25 cents a case) for Maine sardines. The November 1960 index for the subgroup was up about 6.5 percent from November 1959. Prices rose for canned pink salmon (up 12.3 percent), canned tuna (up 2.7 percent), and California sardines (up 1.9 percent), while prices for canned Maine sardines dropped 2.8 percent. As of the end of November 1960, it appeared likely that the canned California sardine pack would be extremely light, the pack of canned tuna was trending slightly upward from the good 1959 pack, the season-end pack of Maine sardines was up about 225,000 cases or 13.0 percent over the 1959 pack, and first-hand supplies of the light pack of canned pink salmon were about exhausted.

Wisconsin

COMMERCIAL OTTER-TRAWL FISHING IN LAKE MICHIGAN WATERS:

During 1959 five Wisconsin fishing vessels operated otter trawls in Lake Michigan on a commercial scale under a permit system. The vessels fished an average of 66 days each in depths ranging from 60 to 200 feet.

Landings by these vessels totaled 1.9 million pounds and consisted of 1,400,000 pounds of chubs, 200,000 pounds of smelt, and 100,000 pounds of alewives and herring. Approximately 1,500,000 pounds were sold for animal food and other industrial purposes with an estimated value of $62,700 to the users. The remainder of the catch, 200,000 pounds, was made up of fish used for human consumption.

Experimental trawling was initiated under a permit system by the State of Wisconsin for the purpose of harvesting underutilized species of fish. The traditional fishing method employing gill nets was found to be uneconomical for the production of industrial fish. Experience in the marine areas has shown that low-priced fish can be economically produced by trawling.

FISHERMEN'S 7-HOUR FIGHT TO LAND 5-TON WHALE-SHARK

This is a story of how 16 men and a giant fish fought for seven hours in the Arabian Sea. It is a story with a flavor of Hemingway's "The Old Man and the Sea" but with a full carcass, not a skeleton, to show at the end--a 32 ft. whale-shark weighing five tons.

The fight took place one sunny morning when an Icelandic master fisherman of the Food and Agriculture Organization (FAO) set out from Mangalore, India, in two boats with 13 trainees and his two assistants. It was just another training trip such as he had been making during the past five years to teach Indian fishermen to handle modern fishing boats, gear, and equipment, but at about 1 o'clock, when the boats were 8 miles north of Mangalore, the trip suddenly became an exciting adventure.

"We saw a big whale-shark swimming on the surface with its back fin sticking out of the sea," the Icelandic fisherman reported to FAO Headquarters at Rome, Italy, late in 1959. "As none of my companions had seen such a huge creature, we sailed towards it."

The only equipment on board which could possibly be used in an attempt to capture the shark was a 2½-ft. long unbarbed iron hook to which was attached a 2-inch manila line. The fishermen decided to attack with this implement.

"We sailed alongside the shark for some time while I waited for a chance to jab the hook through the dorsal fin," he reported. "The chance came when the shark tried to swim under the boat and I got the hook through the center of the dorsal fin.

"And now," he continued, "started a fantastic sailing trip. Our two steel boats, one 32 feet and one 37 feet long, were secured together by a rope and both engines were stopped, yet the shark was able to tow both boats at a speed of 5 knots."

The shark, in a great fury, thrashed and plunged and dragged the boats about for 20 minutes; then the manila rope parted. The giant fish swam away with the hook and 15 fathoms of line.

"We were bitterly disappointed but, after a while, it came to the surface again and I was able to get a nylon line through the eye of the hook," the master fisherman said. "But the shark, finding itself under restraint again, reacted violently, churning up the water in a mad struggle before turning to the open sea, towing my boat with it.

"At about 4:30 p.m. the giant fish slowed down so we shortened the line from 20 to 3 fathoms and now had its tail by the bow of the boat. I cut a notch in the upper fin and looped eight nylon lines around it. We then tried to stop the shark from swimming by raising its tail against the bow but we quickly found that it was not as tired as we believed. No sooner did we tighten the lines than the fish made a tremendous leap, lashed about furiously and then plunged to the depths, trying to drag the boat under the sea. Fortunately, the shark hit bottom before the boat started taking in water forward."

The men were now able to wind 16 lines of nylon and a steel wire from the winch around the upper tail fin. By now most of the fight had gone from the monster so that, with the aid of the mechanically-driven winch, they were able to secure the tail against the bow and tow the shark towards Mangalore. As conditions were too dangerous that night to tow it up the river mouth to the town, one boat with four men was left at anchor to guard the fish.

"At five o'clock next morning we towed the shark in," the fisherman reported, "and I was told that of the 143,000 inhabitants of Mangalore at least 105,000 came down to the beach to see this monster of the deep."

The shark, which was the biggest fish ever seen or heard of in this part of India, was sold for 500 rupees (about US$105).

International

FOOD AND AGRICULTURE ORGANIZATION

34TH SESSION OF COUNCIL ENDS:

The 34th Session of the Council of the Food and Agriculture Organization which ended early in November 1960 welcomed "with gratification" the resolution adopted by the United Nations General Assembly on provision of food surpluses to food-deficient peoples through the United Nations system.

The Council in its fortnight's session considered, among other subjects, matters relating to the Freedom from Hunger Campaign, the world food and agricultural situation, and the expanded technical assistance program. The Council urged all member governments which had not already established national committees for the Freedom from Hunger Campaign to set up committees broadly representative of all organizations and bodies essential to the proper direction and coordination of national activities for the campaign. About the campaign costs the Council said, "various types of fund raising schemes were being considered in different countries . . . and urged member governments to make such national contributions as soon and as generously as possible, particularly in view of the need for getting the campaign fully established."

In its view of the world food and agriculture situation the Council noted that world agricultural production was estimated to have increased by about 2 percent in 1959/60, an increase "slightly in excess of U. N. estimates of the annual rate of growth of the world's population. A further increase in production was probable in 1960/61, although its magnitude could not yet be estimated." The Council expressed its concern over the fact "that progress in per caput supplies of foodstuffs, after allowing for exports, imports, changes in stocks and nonfood uses, had been slow during the past decade." The Council's report said "the prices and terms of trade for agricultural products as a whole in world trade had continued to decline in 1959 . . . (and) noted with regret that in 1960 they appeared so far to have varied little from the average level of 1959, and that there was little prospect of any real improvement in 1960/61." The Council also reiterated its concern at the adverse effects of the worsening in the last few years in the ratio of prices of some agricultural products and at the slow growth of markets for agricultural exports to industrial countries.

The Council reviewed the Expanded Technical Assistance Program of FAO and said "the increased resources available for ETAP in 1961 and the growing work by the Organization for the U. N. Special Fund, as well as urgent needs for technical assistance in the newly independent countries of the African continent, would result in a sharp increase of recruitment for experts."

The Council recommended to the FAO Conference "that one more member may be added to the Council's strength of 25 and proposed that the 26th seat should go to the African region in view of the growing number of independent states emerging in the African continent."

The Council also considered matters relating to the budget, constitution, and organization of FAO. It recommended an increase of $5,700,000 in the budget for the 1962/63 biennium.

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JOINT POLICY COMMITTEE ON OCEANOGRAPHY RECOMMENDED AT 34TH SESSION OF COUNCIL:

The Food and Agriculture Organization (FAO) Council at its 34th Session in the fall of 1960 considered that FAO, in virtue of its

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being charged with international responsibility in the field of fisheries, had a proper and substantial interest in oceanographic research and its application to fisheries, and felt that it was necessary that adequate machinery should exist to coordinate work in this field, since other International Organizations and Agencies also were concerned with it. Of these Agencies the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and FAO were those primarily and generally concerned, but others also had a considerable, but more specific interest in the matter. The Council further noted that sometimes extensive programs of oceanographic research were being carried out by governments, many of them acting in concert within the framework of regional fishery organizations, such as FAO Fisheries Council and other intergovernmental commissions.

The Council noted with satisfaction the recent decision of the Administrative Committee on Coordination to establish a subcommittee on oceanography, and hoped that this would prove an adequate instrument for coordination of secretariat activities of all the U. N. agencies concerned. The Council considered, however, that at the governmental level and with regard to policy questions effective coordination between FAO and UNESCO was needed, since only these two Organizations have wide responsibilities over much of the whole field of oceanography, and in particular are both concerned with biological as well as with physical and chemical aspects. In this connection the Council was informed that the Inter-Governmental Conference on Oceanographic Research convened by UNESCO in July 1960, had recommended to the General Conference of UNESCO the setting up of an Inter-Governmental Oceanographic Commission to be serviced by an Office of Oceanography to be established by the Director-General of UNESCO, with a director and necessary personnel and with the provision that members of the staff of FAO and other Organizations may be added to this personnel by agreement with these Organizations. The Council did not consider that such an arrangement would fulfill the need for coordination at Government level outlined above. It would moreover present considerable administrative difficulties. The Council therefore decided to recommend that FAO and UNESCO should follow a procedure successfully adopted in the relations between FAO on the one hand, and UNICEF on the other, namely to set up a Joint Policy Committee of the two Organizations. General provision for such Joint Policy Committees consisting of an equal number of representatives of each Organization already exists in the Agreement between FAO and UNESCO of 1948. The Council accordingly adopted a resolution to implement this recommendation.

Some Council members indicated that their governments had not yet fully considered the question of coordination of oceanographic activities, but in view of the urgency of this matter the Council hoped that these governments would find it possible to define their policy in this matter before the UNESCO General Conference. (United States Embassy in Rome, November 3, 1960.)

* * * * *

TRAINING PERSONNEL AND ATTRACTING CAPITAL FOR FISHERIES DISCUSSED AT MEETING:

Suggestions for means to attract capital for developing fishery industries and for training personnel to administer credit schemes were advanced at a Food and Agriculture Organization (FAO)-sponsored technical meeting on Credit for Fishery Industries held in Paris in the fall of 1960. Participants represented 31 nations.

The agenda was divided into discussions on objectives of credit policy in developed and developing countries and their implications for the general character of credit assistance; on organizational and operational aspects of fisheries credit schemes; and on coordination, review, and appraisal of credit policies. The special problems of developing countries were discussed separately from those of developed countries.

It soon became apparent from the discussions that policy objectives and the form and structure of credit facilities were closely related to the general state of a country's economic development. The state of evolution of administrative services, in particular their degree of independence from political influence, and personnel policies pursued, were also important. In countries still in the process of developing their economies and their fishery industries, needs are, on the one hand, financial and on the other, educational.

International (Contd.):

Since capital needs could not, under conditions prevailing in most developing countries, be covered from domestic sources, methods of raising capital abroad have to be given careful attention. Participants at the meeting stressed the desirability of interesting international banking institutions in extending credit for fishery development, and in creating conditions within the country which would make investment more attractive. For the latter purpose it was necessary to improve infra-structures and to give private foreign capital an inducement to invest, possibly through tax exemption or reduction and other fiscal devices.

FAO was invited to assist in the task of providing capital by preparing studies of investment opportunities in fisheries in developing countries and studies on development prospects. The meeting felt that the factual information that FAO might be able to assemble would help in persuading international banks to extend or to guarantee fishery credit to developing countries.

Education and training, both of staff to administer credit schemes and of those who were to use the facilities provided with credit assistance, participants agreed, were of at least equal importance as the funds themselves. Here the meeting suggested that FAO, under the Expanded Technical Assistance Program, could provide experts to advise countries in setting up credit services and in holding training centers to educate cadres for credit institutions.

A number of participants were in favor of holding periodic meetings on fishery credit to provide for a continued exchange of experience and views. The consensus was that such meetings should be organized on a regional basis, and FAO was invited to look into the possibility of arranging regional seminars.

Participants expressed a hope that FAO, in addition to preparing a summary of the proceedings of the meeting, would commission a consultant to analyze problems of organization and operation of credit schemes, as described in the 40 working papers prepared for the meeting or mentioned during the discussions.

GENERAL AGREEMENT ON TARIFFS AND TRADE

UNITED STATES SUPPLEMENTARY LIST OF ITEMS FOR TRADE-AGREEMENT NEGOTIATIONS:

On November 22, 1960, the United States Government issued a supplementary list of products (including fishery products) to be considered for possible reduction in duty in exchange for concessions from other countries of benefit to United States export trade. This list supplements the announcement of May 27, 1960, of the intention to participate in the trade agreement negotiations which began at Geneva, Switzerland, in September 1960, under the General Agreement on Tariffs and Trade (GATT).

The list of products was issued to provide an opportunity for all interested persons to submit information on whether or not the United States Government should offer concessions on individual products. Public hearings before the Committee for Reciprocity Information and the U. S. Tariff Commission began on January 5, 1961. In addition to the countries named in the May announcement, the United States may negotiate with Argentina, Cambodia, Ireland, Libya, and Portugal, all negotiating for accession to the GATT, and Turkey which is a contracting party.

The fishery items proposed to be considered for possible reduction in import duty are described in the table.

Under the Trade Agreements Extension Act of 1958, the President is authorized to enter into trade agreements until June 30, 1962. In negotiating such trade agreements, the President may reduce the United States duties existing on July 1, 1958, to the lowest rate calculated by any of three alternative methods: (1) Reducing the rate by not more than 20 percent, provided that no more than a 10-percent reduction may be made effective in any one year; (2) Reducing the rate by not more than 2 percentage points ad valorem (or its ad valorem equivalent in the case of a specific rate or a combination of ad valorem and specific rates). The reduction in any one year under this alternative may not exceed 1 percentage point. (3) Reducing to 50 percent ad valorem or its equivalent any rate which is in excess of that level, provided that not more than one-third of the total reduction may become effective in any one year. The President may also agree to "bind" (continue) existing duties or the duty-free treatment for articles on the free list.

International (Contd.):

United States Tariff Commission public hearings, also began on January 5, in connection with the "peril point" investigation, required by Section 3(a) of the Trade Agreements Extension Act of 1951, as amended.

List of Fishery Products to be Considered for Possible U. S. Concession in Duty

Tariff Par.	SCHEDULE A Stat. Class. (1959)	Brief Description	Duty July 1958	U. S. Imports 1959 ($1,000)
717(a)		Fish, fresh or frozen, whole or beheaded or eviscerated or both:		
	0047300	Lake trout	½¢ lb.	592
	0048800	Eels	½¢ lb.	128
	0055600	Sturgeon, fresh	½¢ lb.	320
	0055700	Sturgeon, frozen	½¢ lb.	302
718(a)		Fish in oil or in oil and other substances:		
	0063590	Sardines (other than smoked), not skinned or boned valued over 30¢ per lb., including weight or immediate container	15%	462
	0063800	Sardines, skinned or boned, valued over 9¢ per lb., including weight of immediate container	30%	1,894
	0064300	Anchovies, valued over 9¢ per lb., including weight of immediate container	15%	2,176
719		Pickled or salted, weighing, with contents, not over 15 lbs. each:		
	0069200	Cod, haddock, hake, pollock, and cusk, neither skinned or boned (except that vertebral column may be removed) containing more than 43% moisture	1/4¢ lb.	1,793
	0070100	Herring (including sprats, pilchards and anchovies) in immediate containers weighing, with contents, more than 15 lbs. each and containing not over 10 lbs. of herring, net weight	3/8¢ lb.	229
	0072000	Mackerel, in bulk or in containers, weighing with contents more than 15 lbs. each	½¢ lb.	455
	0072200	Mackerel in containers (not airtight) weighing, with contents, not over 15 lbs. each	12½%	129
720(a)(4)	0075500	Cod, haddock, hake, pollock, and cusk, smoked or kippered, whole or beheaded, eviscerated or both	1¢ lb.	152
721(e)	0081100 (part)	Oysters, smoked, in airtight containers	6¢ lb.	1,964

The Geneva GATT conference is being held in two phases. Beginning in September 1960, the contracting parties have been negotiating with the Common Market (officially known as the European Economic Community) concerning a new schedule of tariff concessions for the Common Market as a whole, to replace the present schedules of the individual countries. In January 1961, the contracting parties, including the Common Market, expect to negotiate for an exchange of new concessions. The negotiations in this phase will have as their aim the reduction of tariffs and other charges on imports through the exchange of tariff concessions.

The notices issued, respectively, by the Committee for Reciprocity Information, Interdepartmental Committee on Trade Agreements, and the Tariff Commission appeared in the November 22, 1960, Federal Register.

Note: Also see Commercial Fisheries Review, August 1960, pp. 39-41, 75-76.

International (Contd.):

GREAT LAKES FISHERY COMMISSION

INITIAL CHEMICAL TREATMENT OF LAKE SUPERIOR LAMPREY-PRODUCING STREAMS COMPLETED:

On October 31, 1960, the Great Lakes Fishery Commission reported that the Fall River in Baraga County, Mich., had been treated with lampricide. The Fall River operation completes the initial series of chemical treatments of Lake Superior lamprey-producing streams in which many millions of larvae were destroyed. A total of 52 streams in the United States and 20 in Canada have been treated since 1958. Most of the treatments were carried out in 1959. Among the larger streams treated are the Tahquamenon and Ontonagon in the United States and the Kaministikwia, Michipicoten, and Goulais in Canada. A small start was made this year in Georgian Bay, Lake Huron, where four streams were treated, and in Lake Michigan, where seven streams were treated. Treatments are carried out by the staff of the Fisheries Research Board of Canada and the U. S. Bureau of Commercial Fisheries under contract with the Commission.

Positive evidence of a decline in the population of sea lamprey will come from the continued operation of electrical barriers on a number of Lake Superior streams. Numbers of spawning sea lamprey taken in 1961 may be somewhat reduced, but a substantial decrease is not likely because most of those taken at the barriers will have come from stocks which moved to the lake in 1959 before their parent streams were treated. Therefore, the full effects of the chemical program cannot be evident until the adult lamprey spawning run in 1962.

The destruction of young lamprey in streams is expected to reduce lamprey predation on the lake trout that remain in Lake Superior, but the trout population has been so damaged that an immediate recovery cannot be expected. The build-up of trout stocks will be particularly slow in some areas because of the scarcity of spawning fish. Plantings of hatchery-reared trout are needed to aid the recovery of this population.

Steps to restore the lake trout in areas where they have been drastically reduced have been undertaken by federal, state, and provincial agencies cooperating in a joint program coordinated by the Commission. Hatchery-reared trout have already shown a high rate of survival after planting and they will likely play an important part in the recovery of the fishery.

The Great Lakes Fishery Commission is an international organization established by the United States and Canada in 1955. The formulation and implementation of a program to eradicate or minimize sea lamprey populations in the Great Lakes is one of its major responsibilities.

INDO-PACIFIC FISHERIES COUNCIL

NINTH SESSION HELD IN KARACHI:

The Ninth Session of the Indo-Pacific Fisheries Council was held in Karachi, Pakistan, January 3-23, 1961. Among the subjects presented at the Session were Inland Fisheries; Sea Fisheries; Craft and Gear; Food Technology; Socio-Economics and Statistics; Fish Marketing; and Fish Culture in Rice Fields. (United States Embassy, Bangkok, October 14, 1960.)

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

SEVENTH ANNUAL MEETING HELD IN VANCOUVER:

The 7th Annual Meeting of the International North Pacific Fisheries Commission opened in Vancouver, British Columbia, on November 7, 1960. The delegates, who represented three of the world's greatest fishing nations were addressed at the opening session by the Canadian Minister of Fisheries and the Acting Major of Vancouver.

Under the Commission Chairman, the Deputy Minister of Fisheries of Canada, the meeting reviewed the scientific research and developments in the convention area during the past year and made plans for future investigations.

The International North Pacific Fisheries Commission is composed of representatives of Japan, the United States, and Canada. Its primary concern is with conservation programs for species of joint interest in the North Pacific Ocean. These species are salmon, halibut, herring, and king crab. The Commission was established in 1953, under a treaty between Japan, the United States, and Canada. Under the terms of the treaty, Japan has abstained from fishing salmon, halibut, and herring along the North American

International (Contd.):

coast, and Canada abstains from fishing salmon of United States origin in the Bering Sea. The Commission is required to study conditions relating to these abstentions each year, principally in the light of the affected stocks being fully exploited, under scientific investigation and properly conserved by the countries allowed to continue to fish. The Commission also concerns itself with studies of the location of the dividing line in the Pacific Ocean for salmon fishing. At present, Japan refrains from fishing for salmon east of a line which runs north and south along the 175th west longitude, some 2,000 miles west of Vancouver. An extensive research program has been carried out to discover whether or not this line most equitably divides salmon of Asian and North American origin.

Other important considerations included the question of analyzing and publishing the great volume of research material which has accumulated from the Commission's investigations on the high seas. These investigations have been carried out by each of the member nations under a coordinated program laid down by the Commission. Annually, 12 to 15 research vessels have engaged in these important investigations in North Pacific waters.

The meeting brought together about 100 representatives made up of fisheries officials of Government and industry, and leading fisheries scientists of the three countries. There were a number of observers from other international fisheries organizations attending the meeting and also the U. S. S. R., which sent two observers to the meeting.

Argentina

SHRIMP FISHING INDUSTRY TRENDS, OCTOBER 1960:

The Argentine shrimp fishing industry fishes for two species of shrimp--red shrimp (langostino) and common shrimp (camaron). The red shrimp are by far the more important in quantity and value. The large red shrimp, which are the only species exported, are caught principally off the mouth of the Chubut River located near the city of Rawson in east central Argentina during October-January. The size and condition of the Argentine fishing fleet do not permit fishermen to follow the shrimp offshore during the remainder of the year. The smaller common shrimp are caught throughout the year by the Mar del Plata coastal fishing fleet.

There are four processing plants devoted exclusively to shrimp. The largest of these plants can freeze one million pounds of shrimp a month. This plant in addition to its freezing unit has a grading machine. It also is equipped to manufacture flaked ice. However, the shrimp are beheaded, peeled, and deveined by hand. The other three plants have a monthly freezing capacity of 200,000 pounds each but have no equipment other than their freezing units. Canneries in the Mar del Plata area can the small common shrimp along with other fishery products, but no canned shrimp exports are made. No shrimp are breaded in Argentina. It is doubtful whether there are currently any plans to increase the level of mechanization in the Argentine shrimp-processing industry because of the present depressed conditions in the industry. The high domestic price of fresh shrimp has made the export of frozen shrimp unprofitable.

The export price in 1958 and 1959 of red shrimp, in counts of 21 to 35 to the pound, was about US$0.55 per pound f.o.b. Buenos Aires. Smaller sizes sold for US$0.50 per pound f.o.b. Buenos Aires. The 1960 price has not yet been determined since the season has just begun; however, trade sources expect a price increase and a corresponding decrease in exports.

There are no controls on the export of shrimp and no subsidies. Total export taxes amount to 10.5 percent levied on the exporter's gross proceeds.

Processing plant workers are paid an average of 25 pesos (about 30.3 U. S. cents) an hour. Fishermen are now paid 60 pesos a kilogram (about 33 U. S. cents a pound) for heads-on large shrimp. During the fishing season the fishermen earn an average of 10,000 pesos (about $121) a month.

Trade sources in Argentina believe that the industry will recover from the present depression within several years. The principal obstacle to larger catches and, consequently, larger exports at lower prices, is the inadequacy of the fishing fleet. If the recent decree lowering import surcharges on new vessels is successful in stimulating

Argentina (Contd.):

an expansion of the fleet, landings will increase. What is needed primarily are vessels capable of following the shrimp when they leave the Rawson area. Scientific studies are also an important prerequisite to larger catches. (United States Embassy report from Buenos Aires, October 24, 1960.)

Australia

SPINY LOBSTER EXPORTS AND INDUSTRY, FISCAL YEAR 1959/60:

Australia's spiny lobster exports earned US$8.5 million in the 1959/60 fiscal year that ended on June 30, 1960. This amount was about 21 percent more than the earnings for the preceding fiscal year. Spiny lobster tail exports of 7,701,322 pounds and boiled whole spiny lobster exports of 620,839 pounds in 1959/60 both exceeded the 1958/59 figures by 291,909 pounds and 19,967 pounds, respectively. The United States (including Hawaii) was once again the principal market, taking 97.2 percent of the total Australian exports.

Table 1 - Australian Exports of Spiny Lobsters (Tails and Whole Cooked) by Country of Destination, 1958/59 1/ and 1959/60

Country of Destination	1959/60		1958/59	
	Tails	Whole	Tails	Whole
	(1,000 Lbs.)			
United States	7,299	529	7,149	493
Singapore	11	54	11	89
Canada	115	5	13	3
Hawaii	261	2/	226	2/
United Kingdom	2/	-	2/	6
Pacific Islands	2	4	1	5
Persian Gulf	8	3	8	-
Other	6	26	1	5
Total	7,702	621	7,409	601

1/Fiscal Year, July-June. 2/Less than 1,000 pounds.

In estimating total dollar earnings, a price of 9 shillings 10 pence (about US$1.11) a pound, the average for Western Australia, was applied to all shipments. However, as lots of South Australian tails normally bring higher prices, the estimated price may be too low, and final figures could show that export earnings have exceeded the estimate.

In Western Australia, spiny lobster gradings followed closely the previous year's pattern, with some small improvement in quality. The medium grade, the most popular size on the United States market, increased from 19.5 percent of the total state exports for 1958/59 to 20.5 percent for 1959/60. Midget and small grades showed little change, accounting together for 57.8 percent in 1959/60 against 57.5 percent the previous year. Large and jumbo grades showed a slight decrease.

In South Australia, small and midget tails together made up a much smaller proportion of that state's total than they did in Western Australia. Large and jumbo grades made up 50 percent of South Australia's total. In Western Australia the same two grades provided only 22 percent of that state's total exports.

The difference in percentages of grades exported from Western Australia and South Australia is largely due to the species of spiny lobster exploited. The southern spiny lobster (Jasus lalandii), which predominates in South Australian, Victorian, and Tasmanian waters, is larger than the spiny lobster (Panulirus longipes) which makes up the greater part of the Western Australia landings.

All States, except South Australia, increased their spiny lobster landings, and total Australian landings rose by over 2 million pounds. Western Australia produced

Table 2 - Australian Exports of Spiny Lobsters by States, 5-Year Average 1951/52-1955/56 and 1956/57-1959/60

Fiscal Years		Quantity				Value
		Tasmania	South Australia	Australia	Total	
		(1,000 Lbs.)				US$1,000
1959/60	Tails	231	938	6,532	7,701	8,482
	Whole	47	98	476	621	
1958/59	Tails	177	1,150	6,081	7,408	6,930
	Whole	110	271	220	601	
1957/58	Tails	174	1,048	4,614	5,836	5,900
	Whole	110	88	550	748	
1956/57	Tails	167	1,034	3,428	4,629	5,100
	Whole	65	184	73	322	
5-Year Average 1951/52-1955/56	Tails	64	865	3,241	4,170	3,569
	Whole	28	44	61	133	

Australia (Contd.):

69.5 percent of the Australian total, increasing its catch from 17.5 million pounds in 1958/59 to 19.5 million pounds in 1959/60.

Western Australia owes its continued upward trend to intensified fishing on all known grounds (particularly in the area south of the Turtle Dove Shoals), favorable weather, and an increase in the number of freezer boats.

Table 3 - Australian Spiny Lobster Landings, 1953/54 to 1958/59

Year	New South Whales	Victoria	Tasmania	South Australia	Western Australia	Total
	(1,000 Lbs. (Live Weight))					
1959-60	488	924	3,658	3,500	19,513	28,083
1958-59	461	749	3,045	4,250	17,517	26,022
1957-58	525	635	2,985	4,460	1,332	21,932
1956-57	473	689	2,579	4,385	10,763	18,889
1955-56	438	614	2,802	4,000	10,530	18,384
1954-55	510	832	3,256	4,294	10,907	19,799
1953-54	576	1,163	2,527	3,850	9,224	17,340

In South Australia, 185 vessels, employing 380 fishermen, worked either full or part time during the season, but landings fell from about 4.3 million pounds in 1958/59 (final figure) to an estimated 3.5 million pounds. The South Australia Director of Fisheries and Game says:

"The continuing downswing in South Australian cray production is causing much concern and serious consideration is being given to means of halting this decline. It is generally agreed that far too many vessels are engaged in this fishery and in certain areas far too many pots are being used.

"At the end of the season, meetings were held at all crayfishing ports to discuss the industry and its future. Fishermen unanimously agreed that strong measures must be taken if the industry were to be maintained at a reasonable level. However, there was no unanimity of opinion as to all of the means to be adopted.

"It is generally agreed that the present female closed season should be extended to include June, that pot limits should be introduced, and that some restriction should be placed on the entry of new boats into the industry.

"There is also a very strong move to increase the present minimum size to that in Victoria and Tasmania. However, a strong minority considers that a size less than that in Victoria, but larger than the present size in South Australia, would be suitable. All of the fishermen's recommendations are currently being considered."

New South Wales, following a bad year in 1958/59, reported a return to almost normal production with better fishing conditions.

In Tasmania, the increase in production is accounted for by favorable weather on the west coast, which was heavily fished during the 12 months, and by the opening up of several new areas.

Victoria's increase in production of 25 percent was due entirely to increased landings in the western areas. South Australian boats entered the fishery in these areas and were partly responsible for the increased catch. But a significant increase in the catch per boat is also reported. (Australian Fisheries Newsletter, October 1960.)

Note: Also see Commercial Fisheries Review, Feb. 1960 p. 67.

Brazil

FISH MEAL AND OIL INDUSTRY:

As of September 1960, there were 16 fishmeal plants in Brazil, all of which use waste from fish canning, salting, and filleting as their raw material. Because of the high price, whole fish are used only occasionally to increase the protein content, and only by about 5 plants.

The reduction plants are mainly centered around Rio de Janeiro (9 plants) and the salting, freezing, and canning industry of Rio Grande do Sul (5 plants).

The reduction capacity is small. Total capacity for the entire country is estimated to be less than 550 metric tons of raw material per day.

Most reduction equipment is of Danish origin, using direct heat for drying. Six plants are reported to have equipment utilizing stickwater either as solubles or for introducing it into the meal. However, not all

Brazil (Contd.):

of the plants with stickwater equipment are utilizing the stickwater.

In 1948 Brazil produced 2,649 metric tons of fish meal as compared with 3,892 tons in 1959. It is estimated that oil production was less than 500 tons in 1959. As of September 1960, production of meal and oil appeared to be at about the 1959 level.

Approximately five of the plants produced meal with 60 percent protein. The others are reported to have a protein yield between 35 and 50 percent. The meal is used in the growing animal-feed industry. Practically all oil goes to tanneries. Solubles production is small and sold to local feed manufacturers.

The price paid for fish waste varied from nothing to US$5.25 in Rio de Janeiro, to US$7.90 per metric ton at Rio Grande.

In the Rio de Janeiro region most fish waste comes from sardine canneries, while some is from fresh fish and some from salted-pressed sardines, Sardinella aurita. The price the canneries pay for the whole fish varies from US$7.50 to US$45 per ton.

In Rio Grande, fish meal of 60-percent protein sells for US$116 to US$121 a ton. Fish oil sells for US$289 to US$295 a ton. On the other hand, in Rio de Janeiro, 60-percent protein meal sold for US$147 a ton; solubles at US$90 a ton; clarified fish oil at US$316 a ton, and dark oil at US$158 a ton.

There are no Brazilian government restrictions on the production or sale of fish meal and oil, nor is specific aid granted to these industries.

Import and export duties and exchange controls are in effect. Import duties on fish meal are two percent of the c.i.f. value; 30 percent of the c.i.f. value on crude fish oil and 50 percent of the c.i.f. value on refined or purified fish oil. The export tax on fish meal and fish oil is four percent of the f.o.b. value.

Exports of fish meal and fish oil require a prior license, which probably would be denied since there is a shortage of those products in Brazil.

There were no imports or exports of fish meal and oil during 1959 nor during the first six months of 1960. However, imports of 3,000 tons of Peruvian meal are anticipated, with freight, import duty, and exchange controls adding about US$42 a ton to the cost or 57 percent of the f.o.b. price Peruvian port. Brazil's fish-meal imports will probably increase but not fish-oil imports.

In addition to sardine (Sardinella), several species of thread herring (Opisthonema and Harengula) and the menhaden (Brevoortia) occur in the waters of Brazil. The sardine is the only species being fished to any extent.

Brazil's fish-meal production is not expected to expand in the near future, even though the domestic market for fish meal is increasing. Current production is no longer able to meet increasing demand of the mixed feed industry. Scientific poultry raising is just getting started in Brazil and all indications are that it should flourish. (United States Embassy, Mexico City, November 14, 1960.)

British Honduras

SHRIMP FISHING INDUSTRY UNDEVELOPED:

There is very little shrimp exported from British Honduras and only small quantities enter the local market. From time to time rather haphazard attempts have been made to determine whether shrimp exist in commercial quantities in British Honduras waters and a more thorough investigation is now being made by a United States-owned company engaged in exporting spiny lobsters.

The extent of knowledge of the shrimp fishing possibilities in British Honduras is described in a report (Fish in British Honduras) by the Government of British Honduras Fisheries Officer in 1952. The "abundant supply" mentioned in the report is abundant only in relation to the size of the local market (United States Consulate at Belize, October 21, 1960).

An abstract of the report follows:

Twelve experimental trips were made from August 1951-December 1952. These experiments lasted about 5 days on each trip. On the first trip in August 1951, the 15-foot beam trawl refused to sink due to the dryness of the bobbins. These bobbins were replaced by a piece of chain and the net then worked better. Most of these drags yielded shrimp, but only on one occasion in June 1952 were there any signs of shrimp in commercial quantities. This drag was made in 20 fathoms midway between Snake Caye and Manawick Point about 10 miles east of Punta Gorda. Trawling had to be discontinued in the area due to heavy winds.

In July 1952, the M/V Antillas (owned by a United States shipbuilding corporation, and operated in cooperation with the U. S. Fish and Wildlife Service) made a brief visit to the Colony to explore for shrimp. The Fishery Officer accompanied this vessel and work was carried out in all the areas south of Belize, but these explorations yielded only a few shrimp per drag and no commercial quantities were found.

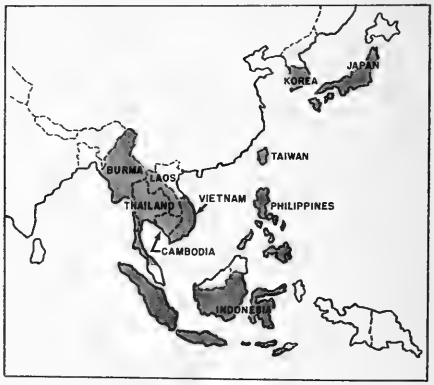
In 1953, a shrimp trawler (the United States privately-owned Celeste Joan) made a brief trip and carried out trawling experiments in the southern areas of the Colony but again, although shrimp were caught, none were found in commercial quantities. Later in the year in November and December and in January 1954, the Freedom, belonging to a British Honduras fisheries firm, carried out experiments and found shrimp in commercial quantities. Later in 1954 work was discontinued as after several more trials no shrimp were found.

The shrimp are similar to those found in the Campeche Banks and elsewhere. Shrimp were found with ripe roe in March 1952 off Sittee, Stann Creek, and Punta Gorda. In the Punta Gorda area the shrimp move inshore in June and July after heavy rains and can be found in large quantities at the mouth of all the rivers. From September to January these shrimp have reached their full size of up to 8 inches in length and in February they go into deeper water. During the period when shrimp are found inshore, the fishermen of the Punta Gorda area catch them with cast nets for bait. As there is always an abundant supply, a small industry could probably be started. Ice would have to be transported from Belize to Punta Gorda where the shrimp could be packed in lightweight boxes and shipped to Belize where there is a very good market. (United States Consulate, Belize, October 21, 1960.)

Burma

NEW JOINT JAPANESE-BURMESE FISHING COMPANY PROPOSED:

A Japanese fishing company and a group of Burmese fish dealers are completing plans for a joint-venture fishing enterprise. Ac-



Burma (Contd.):

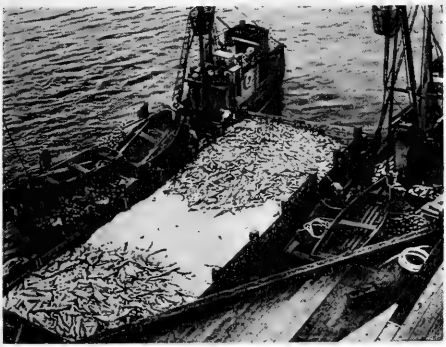
cording to a Burmese press report (confirmed by an officer of the Japanese Embassy), the venture will use a fleet of 33 ships, including a 5,000-ton mothership with facilities for canning and drying the catch and for manufacturing fish paste, two 60-ton trawlers, and 30 trawlers of 20 and 50 tons. Capital is reported at about US$3,150,000, with the Burmese group investing about US$1,890,000 and the Japanese firm putting up the balance. (United States Embassy, Rangoon, October 27, 1960.)

Canada

BRITISH COLUMBIA CANNED SALMON PACK DROPS SHARPLY IN 1960:

The 1960 canned salmon pack by British Columbia canneries of 632,089 standard cases (48 1-lb. cans) dropped sharply (41.3 percent) from the 1,077,097 cases packed in 1959, and was also sharply lower (54.4 percent) than the 1955-59 average annual pack of 1,385,153 cases. The packs of all major salmon species (sockeye, silver, pink, and chum) was down in 1960 as compared with 1959 and the preceding five years (see table).

Note: Also see Commercial Fisheries Review, February 1960 p. 69.



A British Columbia purse seiner unloads its salmon catch onto a cannery fish scow. The salmon are iced to preserve them in prime condition until they are delivered to the cannery for canning.

* * * * *

BRITISH COLUMBIA FISHERY TRENDS, 1960:

With the 1960 salmon catch one of the lowest on record, the year was one of the worst both for fishermen and canners. Moreover, halibut prices declined and the herring and whaling operations were terminated since their continued operation was deemed uneconomic.

Salmon: Salmon, British Columbia's principal dollar earner, experienced its third worst year on record. All salmon species, except Fraser River sockeye (Chilco River run) and Bella Coola pinks, were well below expectations. Particularly hard hit were coho and pink.

Fishing sources are not clear as to the precise reasons for the poor catch. Unsatisfactory environmental conditions for the salmon fry and poor ocean survival are the generally attributed causes.

At the beginning of the 1960 salmon season there was no carry over of significance from the 1959 pack. Probably 500,000 cases of the 632,089 case pack will be sold in Canada. The remainder of the pack will be sold in the United Kingdom, Belgium, France, and other countries. During the 1958 record catch, a large amount of the pack was sold to the United Kingdom. This coincided with the British lifting of restrictions on the im-

Pack of British Columbia Canned Salmon, 1955-60

Species	1960	1959 1/	1958	1957	1956	1955
	(Standard Cases--48-1-Lb. Cans)					
Sockeye (red)	226,905	256,170	1,074,305	228,452	320,096	244,821
Spring (king)	5,913	15,230	10,550	10,481	11,671	17,853
Steelhead	500	867	1,205	1,126	1,254	1,590
Blueback	23,456	10,114	11,103	12,147	10,549	10,544
Coho (silver)	68,891	202,991	120,424	180,911	207,366	175,179
Pink	219,624	458,597	451,802	751,608	363,633	831,253
Chum (keta)	86,800	133,128	230,636	239,539	203,710	124,860
Total	632,089	1,077,097	1,900,025	1,424,264	1,118,279	1,406,100

1/Revised.

Canada (Contd.):

portation of canned salmon. Such a large quantity was bought that in 1959 it is understood that the British still had a considerable surplus from the previous year. With hopes that the 1960 year would have been better than realized, fishery representatives were sent to the United Kingdom in order to stimulate sales. However, the small 1960 catch will probably leave little for export. Some interest is being expressed in the United Kingdom for the importation of frozen salmon and halibut. However, the catch of those salmon species subject to shipment in the frozen state was disappointing.

The 1960 Fraser River sockeye run resulted in a catch of approximately 2,445,000 fish by United States and Canadian fishermen which, with the possible exception of 1936 (escapement unknown), represented the largest run on this four-year cycle since 1912. The preseason predicted catch by the International Pacific Salmon Fisheries Commission staff was 2,000,000 minimum and 2,400,000 maximum.

The catch between the two countries was divided as follows: United States 1,190,000 and Canada 1,255,000 fish--a difference in favor of Canada of 65,000 fish. In the preceding cycle (1956), the United States had 907,000 and Canada had 895,000--a difference in favor of the United States of 12,000 fish.

The bulk of the catch was provided by the run to Chilko Lake which appeared in the fishery on time but was spread over a considerable period of time raising a question in the early part of the season as to its exact size. The actual timing of the peak of the run in the fishery was 8 days later than anticipated, which in all probability was caused by variable oceanographic conditions. The prediction of timing and path of inshore migration of Fraser River sockeye from the ocean and the size of the fish must await rather widespread oceanographic studies being carried out by other agencies for a period of several years.

A number of changes were made in the regulations established prior to the commencement of the fishing season. Two days were added to the United States fishery over the fishing days originally provided for to enable the United States catch to approach equality with that of the Canadian fishery. There was no change in the number of fishing days in Canadian Convention waters in the Strait of Juan de Fuca in spite of the fact that the predicted number of units of fishing gear was substantially exceeded. In the Fraser River area of Canadian Convention waters 8 days of fishing time was removed to provide for escapement and division of the catch between the United States and Canadian fishermen.

The escapement to Chilko Lake is not as yet definitely known, but appears to be about the number considered most satisfactory for providing for a maximum run in 1964. In the other spawning areas considered of minor importance on this cycle the escapement exceeded that of the brood year in certain instances and was below that of the brood year in other instances. In general it may be stated that the Fraser River sockeye run was the only run of that species in British Columbia that approached normality in numbers. All other runs of any importance were generally reported to be below expectations.

This being an even year no pink run returned to the Fraser River.

Halibut: Despite increased landings of halibut, it appears that most fishermen will receive lower earnings because of lower prices. Some Canadian halibut boats sold their catch in Seattle where prices were higher. For example, chicken halibut, which was selling at 12 cents a pound ex-vessel in Vancouver, sold at 17 cents a pound ex-vessel in Seattle. Canadian vessels landed 28,359,200 pounds of halibut at Canadian and American ports up to July 21. At the same time in 1959, landings had totaled 26,140,000 pounds, representing a 2,000,000-pound increase.

Whaling and Herring Closures: The herring fishery did not operate with the exception of fishermen belonging to the Prince Rupert Cooperative. In view of the poor salmon season and growing pressure from fishermen to capitalize in some way on the herring fishery, the companies approached the Union in an effort to negotiate a lower ex-vessel price for herring.

The companies offered to resume the fishery at a somewhat reduced price for herring provided the fishermen delivered the catch to the cannery. This would eliminate the companies' expenses for collector boats.

Canada (Contd.):

The dispute between fishermen and the plants was settled late in November and fishing for herring was resumed. The settlement was on the basis of $8.80 a ton ex-vessel, a reduction from the $13 a ton paid previously. But under the settlement, the collector boats or tendermen were eliminated and fishermen will now deliver directly to the plants.

Another casualty of depressed world prices for oils and protein meals was British Columbia's whaling industry. The one firm, which managed to keep the near-marginal whaling industry operating for the last ten years, concluded that the combination of markets and costs necessitated their decision not to operate in 1960. It is estimated that the close of this operation means the loss of annual payments of over C$600,000, with 150 seamen and plant employees out of work.

Tuna: Four British Columbian purse seiners fished off Oregon and Washington coasts in September 1960 for tuna with no spectacular success. This was the first attempt in many years by British Columbia fishermen to fish for tuna. About 70 tons in all were taken by the four boats using improvised gear. The fish averaged 17.8 pounds and brought a price of about C$300 a ton. The four boats left port after almost a month of negotiations on crew shares between the Vessel Owners' Association and the United Fishermen and Allied Workers' Union. The final agreement was made on a one-trip basis and has now expired. Nevertheless, other owners of large seiners faced with the herring closure and the poor salmon catch were considering venturing into the tuna fishery. Other smaller boats fished tuna for a total British Columbia tuna catch of about 250,000 pounds. In previous years the tuna catch was nonexistent or negligible.

Dogfish Control: This is the third year of the Federal dogfish conrol program. During the first year the Federal Government set up a combined program under which Federal funds were provided for the purchase of dogfish livers coupled with the Government chartering boats to actually catch the predatory fish. In the second year C$250,000 was provided to purchase dogfish. Of this amount only C$150,000 was used. In 1960, the Federal Government appropriated C$150,000 to purchase dogfish. The Federal Government pays 12 Canadian cents a pound for dogfish livers. Because of the poor fishing year which has resulted in more fishermen turning their attention to fishing for dogfish, it is expected that for the first time the entire appropriation will be used.

At present Vancouver packers are paying $14\frac{1}{2}$¢ a pound for dogfish livers. This is $2\frac{1}{2}$¢ above the Government subsidy of 12¢ a pound The United Fishermen and Allied Workers' Union is pressing for a return to the fishermen of 15¢ a pound. They contend that this is the minimum amount required to induce fishermen to catch dogfish and still make a fair earning over expenses.

The companies, on the other hand, claim that they still have 80 percent of the dogfish-liver oil processed last year. They would prefer to process livers for the Government, with the Government buying the livers and selling the oil directly. Company spokesmen also have stated that dogfish liver oil in poultry feed has now been superceded by dry vitamin A but that they are experimenting with new uses for dogfish liver.

The current Government subsidy program will continue until March 31, 1961, or until the fund is exhausted, whichever is sooner. (United States Consulate, November 2, 1960.)

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FISHERY COOPERATIVES, 1959:

Interesting facts on fishery cooperatives are contained in Cooperation in Canada - 1959 published by the Economics Division, Canada Department of Agriculture, Ottawa, Canada.

The value of the business conducted by Canadian fishermen's cooperatives increased by C$3.5 million to reach C$25.3 million in 1959. The value of fish sold was C$21 million and fish supplies sold was C$4 million. Fish and supply sales on a percentage basis are as follows: British Columbia 31, Ontario 15, and Quebec 15. The Maritime Provinces accounted for 37 percent including the business of United Maritime Fishermen, an interprovincial cooperative.

Assets of fishermen's cooperatives increased by C$2.3 million in 1959. Members' equity increased by C$970,000 to reach C$6.5 million during the same year.

Canada (Contd.):

The figures reported were tabulated from the returns of 77 associations with a membership of 10,968. Total assets were C$11.6 million, liabilities to the public C$5.1 million, and liabilities to the members C$3.2 million.

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ONTARIO'S SEA LAMPREY FISHERY:

Ontario's lamprey fishery is a small one. It keeps two men busy for about a month and a half each year. Lampreys are usually not considered edible. But in some parts of the world, they are a delicacy. There are in Ontario enough Canadians from the Baltic countries, where lampreys are eaten, to make lamprey fishing profitable.

Methods learned in Latvia are used by one of the men to harvest some of the lampreys of Lake Huron. The lampreys are trapped in the spring of the year when they ascend the Saugeen River to spawn. A weir is constructed across the river and willow baskets are set either upstream or downstream from the gaps in the weir through which the water flows. Where they are set depends upon the velocity of the water. The lampreys are trapped in these baskets as they attempt to leap through the gaps. During a night as many as 900 may be trapped by this method. In a season, 10,000 lampreys have been caught.

Each morning the night's catch is brought to the cooking tent, where the lampreys are decapitated and roasted on both sides to a golden brown. After roasting they are sprinkled with brine and pressed between two blocks of wood. They are then either packed in bowls or put into cans. So far, the market for lampreys has not been saturated and what is produced is sold in Toronto.

It is interesting to note that the lamprey was a prominent dish of the medieval banquet table. It contains 32 percent oil and 567,000 units of vitamin A per pound. (Canadian Trade News, October 1960.)

* * * * *

WEST COAST DOGFISH LIVER SUBSIDY:

The Canadian Government is again providing a subsidy on dogfish livers in an effort to control the dogfish in British Columbia waters. The Fisheries Minister announced on October 7, 1960, that $150,000 has been earmarked to cover special payments at the rate of 12 cents a pound for dogfish livers delivered to liver-oil plants and collecting stations. This is an increase of two cents a pound over the subsidy paid in 1959. The program, which became effective in October 1960, will continue to the limit of the funds available to March 31, 1961.

It is hoped that the increased financial assistance will induce fishermen to wage a concentrated attack on dogfish populations which have been increasing steadily in British Columbia waters for the past 10 to 15 years. The increase developed following a decline in commercial fishing for the species after the price of liver oil dropped sharply as the wartime demand disappeared and synthetic vitamin A entered the market.

Dogfish causes considerable damage to fishing gear. In some areas they have become so numerous that commercial fishing has been seriously curtailed. Dogfish also interfere with the tidal water sportfishing, which has developed into a very valuable tourist resource in British Columbia.

This current dogfish subsidy program is a follow-up to that which had been carried on by the federal Government in the previous two years. (Trade News, October 1960.)

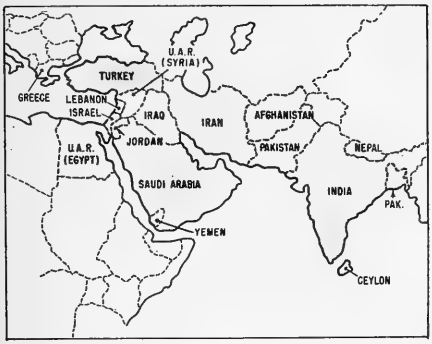
Ceylon

FISHING ENTERPRISE PLANS TO EXPAND:

A joint Ceylonese-Japanese fishing enterprise was incorporated in March 1955 with an authorized capital of 5 million rupees (about US$1,054,000) of which Rs. 600,000 ($126,500) was paid in, 45 percent by the Japanese interests and the balance by the Ceylonese share-holders. The capital investment is in ships and equipment. It is an "approved industry" and has the benefit of a "development rebate" of 40 percent in addition to a flat concession of 66⅔ percent depreciation write-off.

The enterprise started operations in August 1955 to catch and market tuna, marlin and sailfish. Landings in 1959 totaled 2.5 million pounds valued at a little over 2 million rupees ($421,800), of which Rs. 600,000 was reinvested. The company is currently

Ceylon (Contd.):



negotiating for a loan of two million rupees from the Bank of Ceylon to construct a freezing plant and to buy more boats to increase its production and to export frozen tuna, spiny lobster tails, and shrimp. It also plans a canning factory with a capacity to can 10,000 pounds per day. The total investment is estimated at Rs. 3 million ($632,600), the land and buildings to cost Rs. 325,000 ($68,500). (United States Embassy, Colombo, October 24, 1960.)

Note: Values converted at rate of US$1 equals 4.742 rupees.

Cuba

GOVERNMENT AIDS FISHING INDUSTRY TO EXPAND:

Recent activities of the Cuban Fishery Department were reported in the October 5, 1960, issue of the Cuban newspaper El Mundo (October 6, 1960) as follows:

Fishing Vessel Construction and Shipyards: 1,500 men are working in the 15 shipyards located from Pinar del Rio to Oriente, building "Sigma" fishing vessels of 33, 50, 60, 75, and 110 feet in length. Some 900 workers, qualified as shipwrights, helpers, mechanics, painters, and day laborers, work directly in the building of vessels while the rest work in the manufacture of nautical accessories, such as propellers, sanitary services, fishing tackle, etc., which articles are no longer imported.

The 15 shipyards now active are the following: Arroyo de Mantua, Puerto Esperanza, La Coloma, in Pinar del Rio; Batabano, in Habana; Cardenas, in Matanzas; Caibarien, Isabela de Sagua, and Cienfuegos, in Las Villas; Nuevitas and Santa Clara del Sur, in Camaguey; and Puerto Padre, Gibara, Santiago de Cuba Niquero, and Manzanillo in Oriente.

New Fish Plants: Fishermen cooperatives of Antilla, Guatemala (formerly Preston, at Nipe Bay), and Gibara, have new buildings constructed by Cuba's Fishing Department. These buildings consist of offices, fish landing and sorting equipment, cold storage for 35,000 pounds, and functional wharf. The buildings of the Carahatas cooperatives at Las Villas and Matanzas will be built at an early date.

Fish Markets: The cooperative of Fishermen of Surgidero de Batabano has opened six People's Fish Markets for selling fish and shellfish at low prices. These fish markets have been installed at La Salud, Quivican, San Antonio de las Vegas, Batabano, Surgidero de Batabano, and Bejucal.

Fish Box Manufacture: The shop for manufacturing boxes for packing fish and shellfish installed on the banks of the Almendares River has already delivered more than 1,000 boxes to the cooperatives.

The carpenter shop, however, continues to work at a speedy rate in order to provide all the cooperatives with a sufficient number of boxes, thus putting an end to the difficulties of transporting fish to the distributing and consumption centers. (United States Embassy, Habana, October 28, 1960.)

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WHOLESALE AND RETAIL FISH PRICES REGULATED FOR CERTAIN SPECIES:

According to articles which appeared in the Cuban newspapers Revolucion and Infor-

Species	New Prices		Former Prices	
	Wholesale	Retail	Wholesale	Retail
	(Centavos or U. S. Cents Per Lb.)			
Sliced Grouper (Cherna en Ruedas)	32	37	31	39
Grouper Fillets (Filete de Cherna)	44	49	45	50
Tail & Swordfish (Agujay Emperador)	38	42	33	36
Sliced Snapper (Pargo en Ruedas)	55	60	50	55
	(Centavos or U. S. Cents Per Unit)			
Color Minute Steak (Minuta Color)	7	8	5	6
White Minute Steak (Minuta Blanca)	6	7	(No indication)	

Cuba (Contd.):

macion, September 24 and 23, 1960, respectively, the Ministry of Commerce issued Resolution 408 to regulate prices for different types of fish for local consumption (see table). (United States Embassy, Habana, November 7, 1960.)

Denmark

FISHERIES TRENDS, THIRD QUARTER 1960:

Reports from the principal Danish fish auctions indicate that the decline in the quantity and value of the Danish catch of industrial fish continued during the third quarter of 1960. Herring meal exports dropped from

Beach landing craft used for inshore fishing in Denmark. Note portable roller used for beaching the boats.

41,000 metric tons during January-August 1959 to only 18,000 tons in the first eight months of 1960; the decline in value was even greater, from 52 to 17 million kroner (US$7.5 to $2.5 million). Exports of fish oils were halved.

The Danes maintain that the depletion of North Sea herring results not from Danish overfishing but rather from English activity in the breeding grounds in the English channel. A Soviet herring fleet is now active near the Faroes, but Soviet requests for reloading rights in the Faroes have been refused.

Shipments of most varieties of food fish showed a general increase with the January-August totals rising from a value of 182 million kroner (US$26.4 million) in 1959 to 199 million kroner (US$28.9 million) in 1960. On the other hand, sales to the United States of both rainbow trout and frozen fish fillet dropped appreciably.

More than 500 fishing craft were idle because of a dispute and consequent lockout of fishermen at the important west coast port of Esbjerg from August 22 to September 15. Under terms of an agreement, crew members now receive an increased portion of a vessel's catch. Estimates of the value of the lost catch run up to ten million kroner (US$1.5 million).

The effect of European market formations on Danish fisheries was discussed at the Nordic Fisheries Conference in Karlskrona, Sweden. Denmark can expect increased imports of canned fish, the only fish item on which a Danish duty is imposed at p r e s e n t. (United States Embassy report from Copenhagen, dated October 13, 1960.)

El Salvador

SHRIMP INDUSTRY TRENDS, THIRD QUARTER 1960:

The expanding shrimp industry of El Salvador, which exports most of its catch to the United States, continued to show signs of rapid growth during the third quarter of 1960. Present export levels indicate that exports to the United States this year may exceed US$4 million in value, representing a sharp increase since shipments began in the latter part of 1957. Several firms are now seeking additional fishing craft, largely in the United States market. An unexplained series of accidents at the end of September beached two new United States vessels of one firm.

With shrimp now the country's third major export after coffee and cotton, fishing interests remain sensitive to any possibility of United States import controls or tariffs on their product. (U. S. Embassy in San Salvador, October 10, 1960.)

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TWO FIRMS SEEK U. S. FUNDS TO BUILD SHRIMP VESSELS:

Requests from two Salvadoran fishing firms have been received by the Export-Import Bank for financing of United States-

El Salvador (Contd.):

built shrimp vessels. The vessels are to be sold by a St. Augustine, Fla., firm which has sold a number of vessels in that market.

Both companies request 68 percent financing of the purchase price from the Export-Import Bank. They themselves will make 20 percent down payments to the selling company, which in turn will put up 12 percent of the price in each instance. A well-established El Salvador bank is acting as guarantor in both instances. The principal stockholders in the two firms are of good financial reputation. These two requests for financing are in addition to 12 other shrimp fishing vessels for which Export-Import Bank loans have been requested. (United States Embassy, San Salvador, October 17, 1960.)

Egypt

FISHERIES TRENDS, OCTOBER 1960:

Canned Fish: Although there was no production of canned fish in Egypt during 1959, sardine canning began in October 1960 in a new sardine and shrimp canning factory just completed at Damietta with Japanese technical assistance under the Five-Year Plan. Shrimp canning was expected to begin in November 1960. According to the General Organization for Executing the Five-Year Industrial Plan, this plant will have a capacity of 9,600 cans of shrimp and 32,000 cans of sardines for each 8-hour work day, and is expected to employ some 200 workers when in full operation. According to press reports, the estimated value of the annual output of canned fishery products will be about US$738,000.

Cost of the plant is estimated at about US$511,000, including an expenditure of $131,230 (f.o.b. Yokohama) for the Japanese machinery and equipment. Payment arrangements were as follows: 15 percent of the $131,230 on signing of the contract; the balance of 85 percent payable in yearly installments of 8.5 percent at an interest rate of 4.5 percent. The Japanese guarantee operation of the plant for 18 months, and are providing Japanese technicians to supervise initial operations at Damietta. This is the first factory of its kind to be erected in Egypt.

The General Five-Year Plan Organization announced in October 1960 that a decision had been made in principle to establish a plant at Suez for canning tuna and other similar fish caught in the Red Sea. No decision has yet been made as to which country or firm is going to supply the machinery, and it is not expected that the whole project will be in operation for another two years. The planned capacity of the plant is about 900 metric tons of fish per year. Alexandria trade sources state that the plant will probably be built at El Khargada on the Red Sea just below the Gulf of Suez at an estimated cost of about $426,000.

Shrimp Industry: Continuing a steady upward trend since its inception in 1953, the shrimp-freezing and processing industry increased its output in 1959 to more than 884 metric tons, valued at $1,158,000, and it is estimated that 1960 production will exceed that of 1959. The Egyptian Region produced and exported 525 metric tons of frozen shellfish in 1958 and 350 metric tons in 1957. Most of the Egyptian frozen shellfish production is exported.

There are five shrimp-freezing plants currently in operation in the United Arab Republic; three in Alexandria and two in Port Said. Estimated maximum capacity of the five plants is approximately 2,000 metric tons of frozen shrimp per year.

An announcement was made early in October of the formation of a new firm, which is planning to erect a new $57,000 freezing plant in the Gabbary industrial area of Alexandria. The plant, which will be equipped exclusively with United States freezing machinery, is scheduled for completion in February 1961 and will have a maximum capacity of up to eight metric tons of frozen shrimp and fish per 12-hour work day. In addition to shrimp, the new company plans to freeze and export sole, crabs, eels, and octopus to the United States and Europe.

The General Manager of a trading company which markets all the shrimp frozen by one of the Alexandria shrimp-processing companies, is negotiating with an Italian shipping firm for the purchase of a large shrimp trawler (150 gross tons) at a cost of about $113,000. Equipment will include a freezer capable of freezing three tons of shrimp per day. This firm is now seeking Government approval for the purchase as well as for the necessary lira foreign exchange.

Egypt (Contd.):

The problem of increasing the supply of exportable shrimp is the major one facing the Egyptian shrimp-freezing industry which has a capacity in excess of the present supply, or at least in excess of the supply continuously available through current distribution channels.

For every ton of processed headless frozen shrimp, the industry must have a 40-percent average in weight of raw shrimp to account for heading and other shrinkage to produce 2,000 metric tons of processed frozen shrimp. The bulk of the shrimp is processed during the period October to May (peak of the shrimp fishing season), and competition becomes particularly intense among the five plants for the landings during this 8-months period.

The balance of the current shrimp catch not processed for export is consumed locally, with the City of Alexandria itself reportedly the highest per capita consumer of the product in Egypt.

Spiny Lobsters: The Chairman of the Board of General Warehouses of Egypt, following a trip to the United States, stated that he had signed a five-year contract with a New York City firm for the export of frozen spiny lobster tails from the Red Sea. General Warehouses is currently the major shrimp freezing plant in Egypt, producing about one-half of the total supply in 1959. Under terms of the contract, the New York City firm will provide needed technical assistance and processing equipment for the plant upon request. The Egyptian firm hopes to have the plant in operation in 1961. A major problem is to complete satisfactory arrangements for catching the spiny lobsters in the Red Sea and for transport to the processing plant in Alexandria. The fishing area for spiny lobsters is some distance from an adequate road net. The supply has been verified by two research expeditions.

Government Aid: To increase Egypt's over-all fish supply, the Government has allocated funds under the Five-Year Plan to increase the size and improve the equipment of its fishing fleet through cooperatives. In addition, each shrimp freezing firm is studying how to increase and guarantee its own supply of shrimp by such means as direct contracts with fishing fleets and even by contracts with foreign fleets.

Dried and Salted Fish: Although statistics are not available, the Egyptian Region produced a sizable quantity of dried and salted fish in 1959, the bulk of which was consumed domestically. Made up of many small enterprises, the cured fish industry's principal fish dried and salted are lake-caught mullet and sardines. Official Egyptian foreign trade statistics group together both fresh fish and salted, dried, or smoked fish exports. Egypt exported 598 metric tons of fresh, salted, dried or smoked fish, crustaceans and molluscs in 1959. These exports were valued at about $298,000. In 1958 exports totaled 684 metric tons. The decrease in exports in 1959 (1) may be an indication of inaccurate statistics as the over-all commercial catch in 1959 exceeded the 1958 catch by 9 percent; (2) it may reflect increased domestic consumption; or (3) it may indicate the market situation had become less favorable for Egyptian exports of those products. (United States Embassy, Alexandria, October 12, 1960.)

Finland

FISHERIES TRENDS, 1959-60:

According to a country-wide study by Finland's Fisheries Research Section of the Board of Agriculture, the landings of fishery products in 1959 totaled 65,869 metric tons and were valued at Fmk 5,166 million (about US$16.1 million). Coastal and open-sea fishing contributed 46,871 tons (valued at Fmk 2,962 million or about $9.3 million) and lake fishing 18,998 tons (valued at Fmk 2,204 million or about $6.9 million). Of the coastal and open-sea catch, 35,000 tons (75 percent) was Baltic herring; this was 52 percent of the total catch of fish in Finland. Herring fishing by Finnish vessels in Icelandic waters (1,427 tons) and fishing of the small Baltic harring in central parts of the Baltic Sea at the level of Gotland Island (372 tons) are not included in the above figures. During the first 10 months of 1960 landings were smaller than in 1959 in both Finnish and Icelandic waters.

Fishing licenses were held in 1959 by 3,144 professional fishermen in coastal areas and 484 in inland areas. Part-time fishermen numbered 6,144 and 9,163, respectively, and persons fishing for their own household consumption totaled 42,523 and 182,807, respectively.

Finland (Contd.):

Mechanization of fishing vessels has continued and there now are about 85 large trawlers engaged in coastal and Baltic Sea fishing, some 100 small trawlers in coastal archipelagoes, and a few in inland lakes. They have largely been purchased second hand from Sweden and Denmark due to lack of funds for new equipment. There is some interest in increasing the number of large trawlers and extending fishing to the southern parts of the Baltic Sea. The problem of disposal of the surplus of lean Baltic herring (spring-catch) has now been eased somewhat by the installation of freezing equipment on some 30 mink farms. The fur-animal industry consumes about 8,000 tons of Baltic herring yearly.

Under a special fishing agreement signed on February 21, 1959, with the Soviet Union, Finnish fishermen near the new Finnish Russian border on the Gulf of Finland are permitted to carry on fishing in a small area of their former coastal fishing waters in the territory ceded in 1944. Winter fishing by 42 fishermen in February-April 1960 gave a catch valued at Fmk 6 million (US$18,738) and considerably eased the local employment situation. Summer fishing in July 1-October 31 by 15 fishermen yielded a poor catch. A boat shed and life-saving equipment, including one motorboat and two rowboats, have been fitted by the Finnish fishermen on the main island in the permitted fishing area, the United States Embassy in Helsinki reported on November 4, 1960.

German Federal Republic

FISHING FLEET LOOKS FOR NEW FISHING GROUNDS:

While Norwegian fishermen prepare for an experimental fishery off West Africa with the assistance of the research vessel Johan Hjort, West German fishermen have similar plans for fishing off the coasts of Central America and West Africa. The question of sending a number of large trawlers and stern trawlers to those waters is being explored at this time by the West German Department of Fisheries in the Federal Ministry for Food, Agriculture, and Forestry, according to Fiskaren (September 28, 1960), a Norwegian fishery trade periodical. The Fisheries Department head considers that in this connection it is of importance that the fleets of the various private West German trawler companies cooperate more than in the past.

In West German fishery circles there is skepticism about recommendations for initiating a large new fishery in Antarctica. Preferably one might utilize the abundance of krill (small shrimp-like organisms) in the polar seas.

One can conclude that the West German fisheries are in a process of change which can result in some surprises.

Modern German trawler.

At the same time the fishery division in Hamburg is considering the purely economic question as to whether it will profit the West German trawler fleet to expand its fishing area from the North Sea, the northern polar seas, Iceland, and Greenland to tropical fishing in the Equatorial Zone. The prospects for tuna fishing by trawlers off West Africa and Central America will be examined. The possibilities for sardine and anchovy fishing on the Pacific Coast of the United States also are being discussed.

Ghana

UNITED STATES TUNA PACKER SIGNS FISHERY AGREEMENT:

A Japanese representative stationed at Accra, Ghana, Africa, reported early in November 1960 that one of the largest United States tuna packers with headquarters in California concluded a 35-year fishery agreement with Ghana.

In mid-October 1960, Ghana's Minister of Agriculture signed the agreement with the United States packer giving the latter the right to process and export tuna from Ghana.

.Ghana (Contd.):

The agreement stipulates that the packer is privileged to build a tuna-packing plant in Ghana, if he is interested, in addition to freezing facilities. The California firm intends to supply its cannery in Puerto Rico with raw tuna for canning.

A Japanese Fisheries Agency spokesman recently made the following statement:

"Recently, Southeast Asiatic countries, Ceylon, Pakistan, Thailand, and Taiwan (Formosa) are rumored to be planning to undertake tuna fishing. The above agreement has essentially nothing to do with the trend in Southeast Asiatic and other countries mentioned, but Japan should be on the alert, not being satisfied with the present status, for the future of its industry." (Fisheries Economic News, November 7, 1960.)

Greece

STERN TRAWLER FACTORYSHIP TO FISH IN NORTH ATLANTIC:

The Greek stern trawler and freezer factoryship Evangelistria IV is being outfitted in Piraeus (the seaport of Athens) for a trip to the fishing banks in the North Atlantic, according to the October issue of the Greek periodical Alieia as reported in Fiskets Gang (October 27, 1960), a Norwegian fishery trade periodical. This will mark the first visit of a Greek fishing vessel to those distant waters which, until now, have not been utilized by the Greek fishing industry. The projected trip of the Evangelistria IV, a new and very modern vessel, implies that Greece will join the International Commission for the Northwest Atlantic Fisheries as the organization's 14th member.

Greenland

FISHING INDUSTRY, 1960:

Shipments of Greenland products to Denmark and to foreign destinations were valued at a record 35 million kroner (US$5.1 million) during the 1960 season, according to estimates by the Royal Greenland Trade Organization. Fish and fish products comprised about 90 percent of the shipments. This compared with shipments valued at 30 million kroner ($4.4 million) during 1959 and only 23 million kroner ($3.3 million) in 1958. About half of the total sales receipts went to primary producers--fishermen, hunters, and herdsmen--with the other half being spent on manufacture, transportation, and other costs. Royal Greenland Trade, with its virtual monopoly of the Island's trade, realizes no profit.

Production of frozen fish fillets or blocks (mainly cod) increased by 50 percent in 1960, with about 900 metric tons shipped from Sukkertoppen and 250 tons from Narssaq, mostly to the United States. In addition, the factoryship Svaerdfisken produced about 360 tons of fillets at Egedesminde during the summer.

The cod catch reached 1,000 tons at Angmagssalik, where fisheries were established only two years ago. Some 6,000 tons of salt fish (largely cod) were sold to Southern European buyers, but Greenland Trade took a loss on those sales and it plans to switch most of this production into filleting. Twenty tons of salmon were caught, the product of spawn placed in Greenland rivers a few years ago; they were mainly frozen and shipped to Denmark.

The new shrimp-canning plant at Christianskaab doubled output in 1960 to 2 million 80-gram (3.5-oz.) cans. An additional one million cans were turned out at Narssaq. Work is scheduled to begin in the summer of 1961 on a new and larger shrimp plant at Jakobshavn.

In spite of increased domestic production, fear continued to be expressed that the livelihood of Greenland fishermen was being endangered by too intensive fishing by foreign fishing vessels in West Greenland coastal waters. It was estimated that not more than ten percent of the 1960 catch in those waters was taken by Greenlanders, and once again the question was raised of establishing a 12-mile fishing limit.

Royal Greenland Trade is still considering plans for promoting a Joint Danish-Faroese-Greenlander enterprise, possibly privately-owned, for enlarging West Coast fish-processing facilities. The plans reportedly envisage establishment of a large, modern filleting plant, probably at Godthaab. (United States Embassy in Copenhagen, November 17, 1960.)

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Honduras

FOREIGN TRADE IN FISHERY PRODUCTS, 1959:

In 1959, Honduras exported 450,500 pounds of fishery products valued at US$237,600. Exports of shrimp to the United States comprised the bulk of this trade (see table 1).

Table 1 - Honduran Exports of Fishery Products, 1959

Product and Destination	Quantity	Value
	1,000 Lbs.	US$1,000
Fresh Fish:		
United States	4.2	2.8
Fish, Salted, Dried, and Smoked:		
El Salvador	41.7	6.3
Shrimp, Fresh and Frozen:		
United States	404.6	228.5
Total	450.5	237.6

Honduran imports of fishery products amounted to 959,200 pounds valued at US$177,900. Most of the imports from the United States were canned sardines (see table 2)--United States Embassy, Tegucigalpa, September 13, 1960.

Table 2 - Honduran Imports of Fishery Products, 1959

Product and Origin	Quantity	Value
	1,000 Lbs.	US$1,000
Fish, Fresh, or Frozen:		
El Salvador	43.7	5.8
Others	1.8	0.6
Total	45.5	6.4
Cod, Dried, Salted, or Smoked:		
United Kingdom	3.0	0.5
Others	3.0	0.9
Total	6.0	1.4
All Other Fish, Dried, Salted, or Smoked	2.5	0.8
Crustaceans, Fresh, or Frozen:		
El Salvador	79.2	20.9
Others	0.6	0.4
Total	79.8	21.3
Crustaceans and Mollusks, Dried, Salted, Smoked, or in Brine	1.7	1.1
Sardines, Canned:		
United States	623.8	94.8
Canada	134.6	23.8
French Morocco	13.2	4.1
Madeira Is.	3.6	0.9
Others	5.1	2.2
Total	780.3	125.8
Cod, Canned	0.1	1/
Salmon, Canned:		
United States	21.1	9.5
Others	1.9	0.6
Total	23.0	10.1
Anchovies and Pastes, Canned	2.1	1.0
Crustaceans and Mollusks, Canned:		
United States	4.8	3.2
Others	2.0	0.6
Total	6.8	3.8
Caviar and Fish Eggs, Canned	0.2	0.1
Fish Soup, Canned	0.3	0.1
Misc. Fish and Crustacean Preparations, Canned:		
United States	5.6	3.2
Japan	2.8	1.2
Others	2.5	1.6
Total	10.9	6.0
Grand Total	959.2	177.9

1/Less than US$100.

* * * * *

SHRIMP FISHERY:

As of November 1960, Honduras had three shrimp processing and freezing plants located at the Caribbean ports of Puerto Cortes, Caratasca, and in Guanaja in the Bay Islands. These three plants clean, sort, and pack shrimp for shipment to the United States, principally to Miami.

The varieties of shrimp prepared include: large white shrimp (Penaeus stylirostris); striped shrimp (Trachypenaeus byrdi); "pink" shrimp (Xiphopenaeus kroyeri); and white shrimp (Protrachypene precipia).

According to the Direccion General de Recursos Naturales, the total annual landings of shrimp during the past two years were: 1958, 943,319 pounds; and 1959, 1,547,327 pounds. Bad weather conditions adversely affected the catch in 1960.

According to the same source, the November 1960 export prices for heads-off frozen shrimp, varying according to size and type, were US$0.42, $0.47, $0.60, and $0.75 a pound.

Exports of shrimp, by quantity and value, are not available in detail. Table 1 includes exports of shrimp, crabs, conchs, oysters, clams, and spiny lobsters.

Table 1 - Honduras' Exports of Shellfish, 1957-59

Year	Destination	Quantity	Value
		1,000 Lbs.	US$ 1,000
1959	United States	399	225
	Panama	5	4
1958	United States	982	576
1957	United States	25	5

Applicants for a fishing concession must deposit 10 percent of the total investment as a provisional guarantee; the Ministry of Natural Resources requires 1 percent to be deposited in the Central Bank of Honduras at the time of making application. In case the concession is not approved by the National Congress, the guarantee is returned to the interested party. Once the concession is approved by the National Congress the balance, or 9 percent of the total value of the proposed investment, must be deposited. Once operations get under way, the 10-percent guarantee is returned.

The Law of Fishing establishes as a primary requirement that the concessionaires, in order to enjoy the concession granted, must begin the installation of freezing plants, warehouses, etc., within six months from the approval date of the concession by the National Congress. The government agencies that cooperate in controlling the catches are the Ministries of Natural Resources and of Economy and Finance.

Export duties on fish products are 5 percent of the invoice value (the base-price established at US$0.75 a pound was the price applied to shrimp exports in 1958 and 1959). In 1960 this was modified as follows: US$0.50 per gross metric ton, plus 10 percent ad valorem established on a basic price of $0.40 per pound at the port of embarkation.

According to the Office of Hunting and Fishing of the Direccion General de Recursos Naturales, workers in one of the plants in the North are being paid $1.50 for a twelve-hour day, for heading shrimp. Fishermen are paid by the trip or catch.

The estimated maximum potential shrimp catch for Honduras is between 1-3 million pounds of shrimp tails a year. However, the present prospects are not favorable for an increased catch in 1961 due to the restrictions of the 1959 Fishing Law. A shrimp firm in Guanaja, which has been inactive, is reported to be in Europe purchasing equipment to improve and expand its plant. Data are not available on their plans or regarding the equipment they plan to import.

Honduras (Contd.):

One of the important fishing operations has tentative plans to set up a freezer during 1961, either at Trujillo or Cabo Camaron. (United States Embassy, Tegucigalpa, Nov. 15, 1960.)

Iceland

PRODUCTION OF PROCESSED FISHERY PRODUCTS, 1958-59:

Icelandic production of processed fishery products increased from 245,200 metric tons in 1958 to 274,200 tons in 1959. Frozen fillet production led in volume, but declined by 70 tons in 1959. Fish meal production, which ranked second in volume, showed an increase of 21.8 tons in 1959. Salted herring production decreased slightly in 1959 and ranked third. (Aegir, June 1, 1960.)

Icelandic Production of Processed Fishery Products, 1958-59

Product	1959	1958
	(Metric Tons)	
Salt fish, wet	19,000	22,000
Salt fish, dried	7,300	7,800
Stockfish	6,600	7,100
Cod wings, frozen	300	600
Cod wings, salted	500	1,900
Fillets, frozen	67,900	74,900
Offal, frozen	2,400	600
Landings abroad of fresh fish	13,800	10,000
Canned fish	300	400
Fish meal	25,900	21,800
Ocean perch (redfish) meal	16,900	15,000
Herring meal	22,100	6,900
Ocean perch (redfish) body oil	4,900	4,500
Herring body oil	21,600	5,900
Cod-liver oil	10,200	9,800
Herring, frozen	14,700	15,900
Herring, salted	33,800	35,600
Roes, frozen	1,200	900
Roes, salted	4,600	3,600
Shrimp and lobster, frozen	200	-
Total	274,200	245,200

Note: Does not include whole products and fish for domestic consumption.

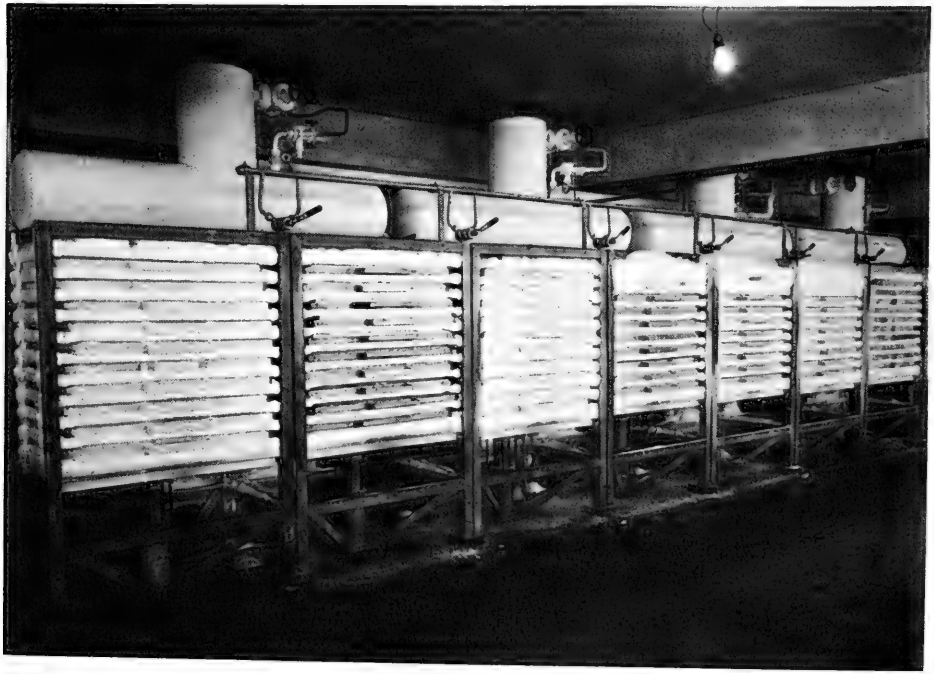

Plate-freezing equipment in a modern Icelandic fillet plant.

India

FAO BIOLOGIST SURVEYS PEARL-OYSTER BEDS:

An Italian marine biologist and diver has until February 1961 to find and chart pearl beds along an 80-mile coastal area in India's Gulf of Manaar before his duties as a biologist at the Rome Zoological Gardens and at the University of Rome bring him back to Italy.

It will be the Italian expert's second trip to the Manaar pearl beds as a Food and Agriculture Organization (FAO) marine biologist and at the invitation of the Indian government. During his first trip he determined what equipment would be best suited for diving in the Gulf of Manaar and trained Indians in its use; he taught the Indians how to collect chemical, physical, and biological data underwater; they charted the pearl beds and drew up a program for future periodical inspection.

"This time, we will do a survey to find out where the best oyster beds are," said the biologist, "and to see if we overlooked any beds. We will also check the old beds to see if they are producing as well as they should. An echo-sounder will be used and if it indicates a pearl bank, we will dive to find out."

The pearl industry currently is not one of India's more important industries for, during the last century, the demand for natural pearls has been replaced by trade in cultured pearls. Now the demand for natural pearls, for their color rather than for their size, is returning, said the Italian expert, and the pearl industry could again be important in India. Coupled with the rising demand for natural pearls is the increase in fishable pearl oysters off India, from causes still unknown.

The Italian biologist and his Indian associates will also chart and investigate chank or conch beds, which yield a large white spiral shell, sacred to the Hindu religion. This shell is used for rings and other jewelery by women in the State of Bengal. It is also found in the beadbands worn for protection by the sacred Hindu cows.

"Nearly one million chank shells are brought up each year during November, December, and January," states the FAO biologist. "They are sold directly to the government for 8 annas (about 10.6 U. S. cents) per shell. Shells with a reverse spiral are particularly valued."

The chank are sought during the three months when the water is not calm enough to search for oysters. The chank, unlike oysters, are widely scattered, and the divers let their canoes drift while they seek a new spot for each dive. Age seems not to be a factor limiting diving for chank, as men 84 years old still dive for them.

The oyster season opens in February for a brief three months before the monsoon tides and winds arrive. The pearl-oyster diver's catch may be between 600 and 2,000 oysters. He may retain one-third of his catch to sell as he chooses, while turning over the remaining two-thirds to the Government which provides most of the facilities for pearl diving as well as operates the pearl camps.

"The pearl camps," the biologist states, "have a flavor all their own, for nature, not man, is used to open the reluctant oysters. The oysters, purchased unopened at government auction by merchants who flock to the camps, are placed in large sacks in the open air for several days. As the oyster expires, his shell opens, and the pearl camp is easily recognized from several miles away."

The oysters are then washed in tanks, the shells discarded to be later cooked down for lime, and the mollusks themselves searched for pearls. The oysters are not the delicacy savored by gourmets; they are bitter, like unripened fruit.

The 80-mile long area of pearl and chank beds in the Gulf of Manaar has been divided into three sectors. Each year, in the brief time when tide and time permits, the biologist hopes it will be possible to check one sector, thereby keeping a continuing check on all. The results will be more pearls for India.

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NEW ICE AND COLD-STORAGE PLANT COMPLETED NEAR BOMBAY:

A new ice and cold-storage plant, built with United States Technical Cooperation Mission (TCM) assistance, was inaugurated

India (Contd.):

on October 24, 1960, at Versova, a suburb of Bombay (about 15 miles north of the city), India. The plant, which has a production capacity of 11 long tons of ice per day and provides cold-storage space for 30 tons of ice and 30 tons of fish, was established by the Versova Fishermen Multipurpose Cooperative Society Limited. Organized in 1948, this cooperative is considered to be one of the best industrial cooperatives in Maharashtra State.

Machinery valued at Rs. 148,000 (US$31,080) was provided by the TCM under one of its aid programs for the development of fisheries in India. The buildings costing approximately Rs. 150,000 ($31,500) were constructed by the cooperative from its own funds and from subsidies and loans received from the Maharashtra Government.

The Bombay City area fishermen will be benefited in two ways from the operation of the plant. They can obtain supplies of ice at relatively cheap prices instead of depending on ice manufacturers in Bombay who allegedly charge excessively high prices during summer months. In addition, they can store the surplus catch in cold storage to help stabilize fish prices.

The members of the Versova cooperative own and operate 450 fishing vessels and 250 "tonies." About 150 of the boats are fitted with marine Diesel engines, of which about one-third was supplied by the TCM. The cooperative owns 11 trucks to transport fish from Versova to the markets in Bombay. It also owns two retail stores which sell Diesel oil and fishing accessories, the United States Consul in Bombay reported on October 28, 1960.

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SHRIMP-PRODUCING AND EXPORTING FIRM SEEKS CAPITAL FOR EXPANSION:

A shrimp-producing and exporting firm located in Kottayam, Kerala State, India, is seeking United States financial collaboration to establish a company to catch, freeze, and export shrimp from the Malabar Coast of South India. The firm is prepared to invest rupees equivalent to approximately US$300,000 in the enterprise. In addition an equal amount of dollar investment is required to purchase one or two trawlers and a few fishing nets and accessories. The firm is prepared to grant equity participation to the United States collaborator in proportion to his share of the capital of the company.

The firm believes that the large quantity of quality shrimp in the Arabian Sea off the Kerala coast should command a good market in the United States and other countries.

The firm proposes that its authorized capital be equivalent to $1 million with the paid-in capital equivalent to $600,000. An annual turnover of $2,000,000 is expected. (United Consulate, Madras, November 1, 1960.)

Japan

EXPORTERS CONSIDER 1961 CANNED TUNA TRADING AGREEMENT:

Japan Canned Foods Exporters Association held a meeting of its canned tuna division towards the latter part of October 1960 and discussed the trading agreement for 1961 with the tuna packers. As a result, the exporters' side generally agreed that the trading method would be the same as in 1960.

Of the 1960 agreed export quantity of 2,200,000 cases of canned tuna in brine for export to the United States, a total of 1,870,000 cases had been shipped by October 1960--870,000 cases of white meat and 1,000,000 cases of light meat. Since the 1960 United States lower-duty quota for canned tuna in brine was almost filled, the remaining 330,000 cases will be included with the 1961 quota. The amount to be exported to the United States in 1961 has not been agreed upon.

The Japanese export prices for canned tuna in brine in October 1960 were $9.15 on white meat and $6.80 a case on light meat, both f.o.b. Japan. These are said to be the lowest prices at which packers can make a profit and if prices drop lower, the packers' side will have no alternative but to stop packing. But the exporters are pessimistic about receiving orders at the October prices and expect a hard time selling canned tuna in brine in 1961. (Fisheries Economic News, October 31, 1960.)

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Japan (Contd.):

EXPORTS OF CANNED TUNA IN OIL, APRIL-AUGUST 1960:

Japan exported a total of 385,606 cases of canned tuna in oil during April-August 1960, considerably less than the 642,333 cases exported in the same period of 1959, according to the tuna packers association. The decline was attributed to the shortage of skipjack in 1960. (Suisan Tsushin, November 15, 1960.)

Japanese Exports of Canned Tuna in Oil by Country of Destination, April-August 1959-1960

Destination	April-August	
	1960	1959
	(Cases)	
West Germany	134,411	197,516
Canada	79,826	68,577
Netherlands	29,321	40,353
Switzerland	28,907	18,026
Belgium	26,641	46,777
Lebanon	17,584	54,098
Great Britain	12,850	43,049

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FIRM NEGOTIATING EXPORT OF FROZEN TUNA TO SOVIET UNION:

A Japanese fishery firm in November 1960 was reported negotiating with the Soviet Union through Japanese exporters for the export of a large quantity of frozen tuna to Russia. Heretofore, exports of frozen tuna have been made mainly to the United States, Italy, Yugoslavia, and others. The firm is inviting four other Japanese firms engaged in the tuna industry to participate.

As a start, an export target of 6,000-10,000 metric tons is envisaged, and it is believed that the Soviet Union could become as big a market as the United States. Exports to the Soviet Union are expected to give Japan an opportunity to regain its position with overseas markets. When the President of the Japanese fishery firm visited the Soviet Union as a member of an inspection team in the summer of 1960 and had an interview with the Soviet Fishery Minister, he proposed the Soviet's import of frozen Japanese tuna. The Minister's enthusiastic attitude at that time caused the Japanese firm to make an effort to export frozen tuna to Russia through a Japanese exporting firm.

Russia is trying to increase food production for its population of some 200,000,000 under a seven-year plan, but has only two tuna vessels. Demand for tuna in the Soviet Union is reported increasing rapidly. (Fisheries Economic News, November 14, 1960.)

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EASTERN PACIFIC TUNA FISHING FORECAST FOR DECEMBER 1960:

Kanagawa Prefecture Fisheries Experimental Station in Japan released its forecast of Eastern Pacific tuna fishing in December 1960 as follows (tonnage indicates catch per 1,800 hooks):

East Pacific, the first fishing ground (north of 20° N. latitude, east of 150° W. longitude): Big-eyed fishing in the sea area, 28°-32° N. latitude, 140°-150° W. longitude, is expected to be good at the rate of 2.6 metric tons. No catch of striped marlin is expected.

East Pacific, the second fishing ground (5°-20° N. latitude, east of 150° W. longitude): Yellowfin fishing in the sea area, 5°-12° N. latitude, 110°-150° W. longitude, will be poor at 0.9 ton. Good fishing period will still prevail for big-eyed but catch will be on the decrease in the western region of the area and fishing rate in December will be 3 tons on the west side of 130° W. longitude and 6 tons on its eastern side.

East Pacific, the third fishing ground (5° N. latitude -10° S. latitude, east of 150° W. longitude): Poor fishing is expected for both yellowfin and big-eyed in the area, the equator-5° N. latitude, 110°-150° W. longitude, at a rate of 1.4-1.8 tons. A good fishing period for big-eyed is expected at 5-7 tons. (Japanese periodical, November 9, 1960.)

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TUNA EXPLORATIONS IN INDIAN OCEAN:

Tuna fishing grounds around Madagascar and the Indian Ocean are being explored by the Japanese guidance ship Taisei Maru. The Mie Prefecture Fishery Experimental Station late in October 1960 received a report on the vessel's 11th trip as follows:

The first experimental operation was carried out south southeast of Madagascar but failed to yield results. The second operation in the south southwest sea area of the Island revealed that the water temperature was 17.7° C. (63.9° F.) in the 328-foot layer at 28° south latitude, 51° east longitude and condition of the layers seemed comparatively

Japan (Contd.):

stabilized. As a result of 10 experimental operations, 1 south southeast of Madagascar and 9 in the southwest sea area, catch ratios were found to be 5.74 percent and 9.35 percent, respectively. In the southeast area 88 percent of the catch was albacore, 7.4 percent yellowfin, and 4.6 percent big-eyed mixed. In the southwest area species caught were numerous with yellowfin conspicuously more than others, followed by swordfish. The reason why yellowfin were found more was that the water temperature was 2°-4° C. higher than in the southeast area. Also, the branch stream running southward through the Mozambique Channel along the African coast had an effect on fishing in the southeast area and the fish caught were large-sized, comparatively speaking.

More than 30 vessels were operating in the Madagascar sea area in October 1960 with albacore as their objective generally. Fishing seemed better in the southern area. A considerable number of fishing vessels were operating north and in the central part south of the Mozambique Channel. These fishing grounds were entirely undeveloped up to a year ago. In waters around the Chagos Islands, there were some 10 vessels fishing for yellowfin and big-eyed, but fishing was only "fair." (Fisheries Economic News, October 28, 1960.)

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TUNA FISHING POOR IN ATLANTIC:

Japanese reported tuna fishing in the Atlantic was poor in the fall of 1960. The same condition was reported in 1959. Vessels in 1960 experienced extremely poor yellowfin fishing and catches were 5-7 metric tons a day on the average for each vessel. Export shipments for Europe were from 1 month to 1½ months behind schedule. It is not unusual that the catch ratio of yellowfin declines every year after October, but in 1960 even albacore fishing was below expectations.

The market price of Atlantic tuna in the fall of 1960 ranged around US$245 a metric ton for November shipment and $250-255 for December shipment to Italy. The Japanese exporters associations' conference rate for January 1961 was $260 a ton. The price of albacore for shipment to the United States delivered in Africa was $255-260. (Suisan Tsushin, November 7, 1960.)

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RECENTLY-PURCHASED BRITISH WHALING FLEET TO OPERATE IN ANTARCTIC:

A Japanese whaling company recently purchased the 15,715 gross ton Balaena, a whaling factoryship, along with a refrigerator ship, and seven catcher boats from a British whaling company, the United States Consul at Yokohama reported on October 24, 1960. This purchase, at a reported price of 3 billion yen (about US$8,300,000), gives Japan her seventh whaling fleet and makes the country second in the number of whaling fleets to Norway. The Balaena arrived at Yokohama on September 29, 1960, for engine overhaul and minor structural modifications. It left on November 1, 1960, to join the catcher boats at Cape Town, South Africa, before proceeding to the Antarctic. The Balaena was constructed in 1946 and has refrigeration equipment.

One third of the purchase price of the whaling fleet was paid in cash with the remainder to be paid in the next five years with no interest. The Japanese whaling firm's other whaling fleet was also purchased in toto in 1956 from a Panamanian company.

Libya

FISHERIES TRENDS, JULY-SEPTEMBER 1960:

The tuna fishing season in the Tripolitania area of Libya ended early in the July-September 1960 quarter and the catch was disappointing. Most of the canning factories closed down earlier than usual.

Despite excellent weather, local fishing operations were limited as skilled labor was unavailable. Many of the Maltese fishermen, long resident in Tripoli, have turned to other much more remunerative occupations and are either engaged by offshore petroleum geophysical survey organizations or have given up fishing for stevedoring or other employment.

There were at least 36 licensed Greek sponge fishermen operating in Cyrenaican waters during the quarter. Although there was no Greek sponge fishing activity in Tripolitania this season, the Cyrenaican sponge beds, which have lain practically undisturbed for two years, were providing a good yield. By mid-August (about mid-season) the season was providentially free of fatal accidents

Libya (Contd.):

and the fishermen indulged in optimistic forecasts, predicting a yield equal to the high levels of 1955 and 1956. (United States Embassy, Tripoli, October 31, 1960.)

Malaya

SHRIMP FISHING INDUSTRY:

The trade statistics of the Federation of Malaya do not list a classification for shrimp. Exports of shrimp, according to an official of the Malayan Statistics Department, are included in the category of Crustacea. This same source indicates, however, that there have never been any exports of fresh or frozen shrimp from the Federation and only minimal quantities of salted shrimp.

There are no vessels exclusively engaged in fishing for shrimp. Fishing is done on a cooperative basis by coastal village fishermen in small sail or motorboats. Most of the shrimp catch is made in Indonesian waters. Shrimp landings that are not consumed locally are salted and exported either to Singapore or Hong Kong. Shipments to Singapore are believed to be re-exported to Indonesia and Borneo. The official of the Statistics Department expressed the belief that no shrimp have ever been exported to the United States, and there is no likelihood of such exports in the near future.

In 1959, exports from the Federation of "crustacea, salted, dried, or simply cooked" (believed to consist largely of shrimp) amounted to 292 tons valued at about US$205,316 Except for 3.6 tons shipped to Hong Kong, all was destined for Singapore. (U. S. Embassy in Kuala Lumpur, October 28, 1960.)

Morocco

FISHERY TRENDS, JULY 1960:

Although exact figures are not available for the entire country, fishery landings in Morocco during 1960 were good. Sardine landings were heavy, and the major port reports a record catch. Since the beginning of the season on May 8, up to September 10, 1960, 65,000 metric tons of sardines were landed in Safi. The previous annual record was 61,000 tons. In September 1960 good catches were still being made. During June and July, 250,000 cases of canned sardines were exported from Morocco, an amount exceeded only twice in the past ten years.

Moroccan Fishery Products Exports, January-July 1958-60

Product	Quantity January-July			Value January-July		
	1960	1959	1958	1960	1959	1958
	(Metric Tons)			(US$1,000 1/)		
Fresh fish	7,655	6,965	4,770	1,638	1,406	861
Fish meal	3,370	7,474	11,686	361	840	1,024
Canned Fish:						
Sardines	14,174	13,975	12,526	7,672	6,346	5,381
Tuna	1,095	1,508	1,504	750	892	1,020
Other	2,348	1,245	542	601	222	116
Total	28,642	31,167	31,028	11,022	9,706	8,402

1/US$1 equals 5.06 dirhams.

Fish exports during the first seven months of 1960 do not show as good a picture for the entire industry. Total exports dropped off in volume, but increased more in value than the 20-percent devaluation of the Moroccan franc in October 1959. The fish-meal industry was in trouble, as world prices made the Moroccan product noncompetitive. Tuna exports also suffered as the supplies of that fish did not hold up. The improvement in other types of canned fish exports reflects sales of mackerel. Sardine exports have been good since the devaluation of the Moroccan franc, and stocks were not being built up as they were before devaluation. The export of fresh fish, particularly sardines, is still being restricted for fear that they will be canned and put in competition with the Moroccan canning industry. In conjunction with this, the "Operation Fish" campaign has been re-instituted to increase fish consumption. Fresh sardines at low prices are being made available to the entire population in the Casablanca area. (United States Embassy, Rabat, October 14, 1960.)

New Zealand

TUNA FISHERY PROPOSED:

According to New Zealand press reports in November 1960, a fishery firm expected to initiate tuna fishing off the north coast of the North Island. Initially, operations were to be quite limited, but the company has asked for Government financial assistance to expand operations.

The Wellington Evening Post of November 3, 1960, reports:

New Zealand (Contd.):

"A depot at Awanui had been built to hold about 20 to 25 tons of frozen tuna, and the freezing plant was now being installed. The depot would be a holding place, and the fish brought by refrigerated truck to Hikurangi for processing.

"The company would supply Watties cannery if requested, and there was a United States market for headed and cleaned tuna," the Managing Director of the company said. The decision to go ahead, he added, had been made as the result of research work by two fishing boats on the far north coast over five weeks, which had just finished.

"We are now certain that tuna can be caught off Northland coasts in quite large quantities," the Managing Director said. "Unfortunately, our boats are too small, the fish were too fast for them, and the fishermen have had no previous experience of tuna fishing."

The newspaper article continued: "Through the company's representative in Australia tuna fishing had been investigated there. It was reported back that South Australia had developed a booming tuna fishing industry which this season doubled its output for the fourth successive year." This report has been sent by the firm's Managing Director to the Minister of Marine to support the request for aid in setting up the New Zealand industry. The Managing Director said there were fishermen available to go from North Island to Australia to learn about the technique of tuna fishing. He himself hoped to go to inquire personally into the industry. (United States Embassy in Wellington, Nov. 4, 1960.)

Norway

EXPEDITION FISHES FOR TUNA OFF WEST AFRICA:

With the catch of cod and herring on Norwegian banks getting smaller each year, Norwegian fishermen were fishing for tuna off the coast of West Africa as of November 1960. A ten-vessel experimental expedition, directed by marine biologists aboard the ocean research vessel Johan Hjort, operated out of the port of Dakar. Equipped with special gear for catching tuna, the vessels were accompanied by the 1,200 ton deep-freezing ship Cariba. The frozen catch was scheduled to be transported to Puerto Rico in 500-ton refrigerated ships. A United States tuna canning company contracted to buy up to 6,000 tons of Norwegian tuna, at prevailing prices.

The Directorate of Fisheries, a branch of the Norwegian Ministry of Fisheries, made the ocean research vessel Johan Hjort available free of charge. The Norwegian Fishing Industry's Research Fund pledged Kr. 75,000 (US$10,504) to each participating vessel as a guaranty against operating losses incurred during the first two months. After that period, vessels were free to operate at their own risk. Moreover, the firm which owns and operates the refrigerated vessels engaged in the Norwegian fishing venture received a state guaranty of Kr. 1.5 million (US$210,084).
Note: Also see Commercial Fisheries Review, November 1960 p. 80.

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FISHERMEN FEAR DEPLETION OF FISH STOCKS:

In the course of a ministerial interpellation, a Member of the Norwegian Storting recently stated that 70 to 80 percent of the fish caught by trawl off the coast of Finnmark County are undersize. He expressed a fear on behalf of the fishermen of that area that if the present excessive catches in the North Atlantic waters are allowed to continue, the Norwegian coastal and spawning cod fisheries would soon be brought to a stop.

The Minister of Fisheries replied he had reason to believe that the International Convention for the Regulation of the Measure of Fishing Nets and the Size Limits of Fish--to which most European nations, including the U. S. S. R. adhere--would take action in the matter in 1961, and intimated that the member states may adopt a regulation requiring the widening of the cod-end mesh in trawl nets to 13 centimeters (about 5.1 inches).

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QUOTA SET FOR 1960/61 ANTARCTIC WHALING SEASON:

According to a Norwegian press report which has been confirmed by the Ministry of Foreign Affairs, the Norwegian Government has set the whale quota for the Norwegian whaling expeditions taking part in

Norway (Contd.):

the 1960/61 Antarctic season at 5,800 blue-whale units, the quota which was fixed for the 1959/60 season. The Government however reserved the right to revise the quota in the event that any of the other whaling nations raise their quotas above those of last year. A spokesman for the whaling industry is reported to have stated to the press that since it now appears Japan will increase its quota, the Norwegian quota can be expected to increase correspondingly.

The Norwegian quota is based on the actual catch in the 1958/59 season. Due to a combination of bad weather, the use of fewer catching boats, and perhaps a decline in the whale stocks, the Norwegian catch in 1959/60 season amounted to only 4,565 blue-whale units. It is expected that Norway will again send 8 factoryships to the Antarctic, but a greater number of whale-catching boats will be used this season. The division of the quota among the individual Norwegian expeditions will be the same as in 1959/60.

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SALT-FISH EXPORT PROSPECTS TO BRAZILIAN MARKET IMPROVE:

The marketing prospects in Brazil for Norwegian klipfish (salt fish) have become somewhat brighter following Brazil's decision to make an unlimited amount of foreign currency available for klipfish purchases, according to Norwegian press reports. Consequently, the Norwegian kroner has become cheaper in relation to the Brazilian cruzeiro with the result that Norwegian klipfish prices in Brazil also have gone down by about 20 percent. The reports caution, however, that the long-term outlook for exports of klipfish to Brazil will continue to be uncertain. Due to a falling off in sales, fairly sizable stocks of unsold klipfish have accumulated in Norwegian warehouses.

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SHRIMP INDUSTRY:

General Description of Industry: The Norwegian shrimp is the small deep-water type (Pandalus borealis) found in the eastern North Atlantic Ocean. Shrimp are caught by shrimp trawls along most parts of the Norwegian coast and on the banks just off the coast. It is generally an all-year-round fishery but catches are low between December and March. The shrimp must be at least 6 centimeters (2.36 inches) long from the front edge of the eyes to the end of the tail. It is estimated that there are about 250 heads-on shrimp per kilogram or about 115 per pound. About 60 shrimp (headless and peeled) are packed in a quarter "Dingley" can which has a net weight of 3¾ ounces.

There are approximately 60 processing plants in Norway which handle shrimp either for freezing or canning. Most of the plants handle a variety of fish products and only a very few small plants work solely with shrimp. Peeling is done nearly entirely by hand. Only one peeling machine is in use in Norway and this is mainly for experimental purposes. There are no plans for further mechanization in the foreseeable future. No breaded shrimp is produced.

About 35 percent of the shrimp catch is sold for fresh consumption and about 65 percent for freezing or cannng; the larger of the shrimp caught are used for the former, and the smaller for the latter. Between 90 and 95 percent of the entire catch is exported.

Landings: Norwegian shrimp landings have been increasing steadily as shown in table 1.

Table 1 - Norway's Landings of Whole Shrimp, 1956-60

Year	Quantity	Ex-vessel Value	
	1,000 Lbs.	1,000 Kroner 1/	US$ 1,000
1960 2/ ...	22,046	33,000	4,620
1959	21,453	31,800	4,452
1958	16,027	22,575	3,161
1957	15,589	20,877	2,923
1956	13,926	18,785	2,630

1/US$1 equals 7.1428 kroner. 2/Estimated.

Vessel Operations: About 1,000 fishing vessels take part in the shrimp fishery, most of which engage in other fisheries as well. The vessels are generally from 30 to 50 feet in length and are powered by 20- to 40-horsepower engines. They are all under Norwegian ownership. Foreign vessels

Table 2 - Norway's Exports of Fresh, Frozen, and Canned Shrimp, 1956-59 and January-June 1960

Year - Destination	Fresh & Frozen		Canned	
	Quantity	Value	Quantity	Value
	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000
Jan.-June 1960:				
United Kingdom ...	2,255	1,419	743	492
Sweden	1,158	642	26	17
United States	-	-	64	43
Other	280	200	150	112
Total	3,693	2,261	983	664
1959:				
United Kingdom	4,383	2,852	2,579	1,787
Sweden	1,054	730	44	32
United States	-	-	203	134
Other	139	105	959	661
Total	5,576	3,687	3,785	2,614
1958:				
United Kingdom	3,258	2,073	1,742	1,107
Sweden	1,367	894	104	69
United States	7	4	174	108
Other	114	71	692	455
Total	4,746	3,042	2,712	1,739
1957:				
United Kingdom	3,688	2,080	1,836	1,131
Sweden	1,089	643	161	117
United States	26	19	161	98
Other	73	51	860	534
Total	4,876	2,793	3,018	1,880
1956:				
United Kingdom	3,589	1,713	1,409	866
Sweden	1,010	602	161	113
United States	-	-	229	142
Other	99	54	1,077	673
Total	4,698	2,369	2,876	1,794

Norway (Contd.):

Table 3 - Export Prices for Norwegian Processed Shrimp, 1957-59

Year	Fresh 1/		Frozen 1/		Canned 1/	
	Kr. per Kilo	US¢ per Lb.	Kr. per Kilo	US¢ per Lb.	Kr. per Kilo	US¢ per Lb.
1960 (Jan.-June)	6.46	41.0	13.49	85.7	10.69	67.9
1959	6.95	44.1	13.69	86.9	10.88	69.1
1958	2/	2/	2/	2/	10.10	64.1
1957	2/	2/	2/	2/	9.81	62.3

1/Headless and peeled 2/Unavailable.

can and do land shrimp in Norway, but the quantities involved are relatively small.

Quantity and Value of Exports. The quantity and value of Norwegian shrimp exports by type and country of destination are shown in table 2.

Export Prices: Computed from the total quantity and value of shrimp exports, the average export prices are shown in table 3.

The United Kingdom and Sweden are the principal markets for Norwegian shrimp. In terms of value, sales of shrimp to the United States during the years 1956-59 accounted for about 2 to 3 percent of Norway's total exports of shrimp. Norway is now exporting only canned shrimp to the United States. The frozen shrimp are said to be too high in price for the American market.

Current Export Controls: There are no controls, subsidies, or taxes on the export of shrimp from Norway.

Wage Rates for Processing: Male workers in the shrimp processing industry are generally paid on an hourly basis. Their wages vary between 4.70 and 5.00 kroner (65.8-70.0 U.S. cents) per hour, or considerably below the average of 6.30 kroner (88.2 U.S. cents) per hour for all male workers in industry. Most of the female workers are paid on a piecework basis. Their earnings are somewhat higher than for the women who are paid by the hour. The latter earn from 3.00 to 3.30 kroner (42.0-46.2 U.S. cents) per hour as compared to the average for all female industrial workers of about 4.25 kroner (59.5 U.S. cents) per hour.

Basis of Payment to Fishermen: The shrimp fishermen sell their catches to their regional cooperative sales organizations, which in turn sell the shrimp to Norwegian shrimp processors and exporters. The prices received by the fishermen are determined by the prices obtained by the sales organizations. The organizations retain 4 percent of the net selling price to cover their operating expenses. The minimum export prices, which are established by the industry and approved by the Government, are very seldom utilized. Actual market prices usually run from 10 to 20 percent above the minimum prices.

The Norwegian shrimp fisherman's income is among the highest in the fishing industry and is somewhat above the average for industrial workers. The number of fishermen engaging solely in shrimp fishing is steadily increasing. The fishermen usually own their boats and frequently the family operates the boat as a unit.

Possibility of Expanding: There is considerable searching for new shrimp fishing grounds and workable areas are located from time to time. Provided the market exists, it is expected that the annual Norwegian shrimp catch will continue to increase slowly over the next few years. (United States Embassy in Oslo, November 8, 1960.)

Poland

AIDS IN DEVELOPMENT OF GUINEA'S FISHING INDUSTRY:

An agreement has been signed for the formation of a mixed Polish-Guinean fishing company, scheduled to begin operations on March 1, 1961. Poland is to supply trawlers, four of which--manned by Polish crews--will sail shortly from Gdynia. The Guinean Government is to provide a base of operations with a refrigeration plant, fish-meal production plant, and warehouses. About 50 Guinean specialists and fishermen will be trained in Poland. The Polish research vessel Birkut will sail shortly for the West African fishing grounds, according to an October 20, 1960, dispatch from the United States Embassy in Warsaw.

Portugal

EXPORT OF SEAWEEDS PROHIBITED:

A ministerial order published in the Portuguese Official Gazette (Diario do Governo, I Serie, No. 251) of October 28, 1960, prohibits the exportation of seaweed except in cases when the Regulatory Committee on Chemicals and Pharmaceuticals, the export control agency of the Portuguese Government, finds that exports of seaweed are justified and in no way harmful to the economy of the country.

According to this legislative measure, the prohibition is to last until such time as the study which is now being carried out by a commission appointed early in 1960 is completed. This study will clarify the methods and/or conditions under which seaweed is to be gathered and sold, states a November 9,

Portugal (Contd.):

1960, dispatch from the United States Embassy in Lisbon.

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FISHERY TRENDS AS OF THIRD QUARTER 1960:

At the end of the third quarter of 1960, prospects for the Portuguese cod and sardine fisheries were good, and the catch of other fish was at a very satisfactory level. Landings (exclusive of cod) for the first five months of 1960 amounted to 60,417 metric tons (15,393 tons of sardines) as compared with 59,567 tons (11,994 tons of sardines) landed in the same period of 1959.

Landings by the trawl fishery during January-May were down about 8 percent from 1959, but prices were appreciably higher and the value of the May 1960 catch was greater than that of May 1959. Prices paid for other catches, including sardines, also ranged higher, according to an October 25, 1960, dispatch from Lisbon.

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COD-FISHING FLEET ENDS SEASON WITH BETTER CATCH:

The Portuguese cod fleet left the Newfoundland and Greenland fishing grounds in late October 1960. Among the vessels already home was the hospital and support vessel Gil Eannes, states a November 16 dispatch from the United States Embassy in Lisbon. Only one vessel was lost this season, a 77-gross-ton hand-line schooner.

The catch for the 1960/61 season is estimated at about 64,000 metric tons of wet-salted cod, not a large catch, but much more satisfactory than the catches of the 1958/59 and 1959/60 seasons, when 53,344 tons and 59,826 tons, respectively, were landed.

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PRICE CONTROLS ON FRESH FISH SALES EXTENDED:

A Portuguese ministerial order of October 15, 1960, extended Government control measures over fresh fish distribution, in order to help assure that an adequate supply of fresh fish at low prices would be available until development plans for the fishing industry are implemented.

The order of the Ministry of the Navy and the Secretariat of State for Commerce establishes maximum profit margins for wholesalers and retailers, confirms current maximum auction prices at the wholesale fish markets, limits the number of middlemen between fishermen and consumer, and otherwise establishes regulations to enforce distribution at the planned prices. As in the past, prices of a number of the most popular commercial species remain uncontrolled.

A news release accompanying the order pointed out that fish catches have been increasing and that many measures to improve the fresh-fish supply are planned, or being carried out. But it will be sometime before there is a marked change and it is hoped that the order will help improve the supply immediately. As a complementary measure, the National Fish Supply Service is to sell fish direct to the public at posted prices from specially-equipped trucks on a trial basis. At the present time there are in Lisbon a number of retail fish outlets operated by the Trawl Fishing Shipowners Guild where fresh fish of the less expensive varieties are sold at controlled prices. However, the supply available is frequently less than the demand, the fish are available only in the morning and lines frequently form in front of the stores before they open.

Sardines are not dealt with in the order because, as the order states, a special commission was appointed in August to make a study of sardine fishing and marketing for the canning industry, and the results of that study must first be considered. The Commission has representatives of both industry and government.

The dried cod supply situation during the third quarter of 1960 was adequate, and a statement issued by the Office of the Secretary of State for Commerce indicated that with a satisfactory catch anticipated for the 1960/61 cod season, no critical shortage was feared in the next year. However, the statement said, ceiling prices might have to be revised at some time in the future as production costs have risen substantially since those prices were established. (United States Embassy, Lisbon, October 25 and 27, 1960.)

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SHRIMP FISHERY UNDEVELOPED:

Portugal has no shrimp fishery or vessels that fish exclusively for shrimp. Small quan-

Portugal (Contd.):

tities of shrimp are hand-netted on a casual basis by individual fishermen for sale fresh in retail markets. One or two freezing plants primarily concerned with other fishery products handle some shrimp, but the quantity is negligible.

Shrimp landings (mostly small shrimp) in Portugal during 1959 amounted to 120.3 metric tons as compared with 75.5 tons in 1958 and 48.8 tons in 1956.

Shrimp, particularly the larger species, are imported from Spain into Portugal, and it is possible that the Portuguese Government may attempt in the future to expand the shrimp fishery, but at present there are no such plans, the United States Embassy in Lisbon reported on October 28, 1960.

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TUNA PRODUCTION AND FOREIGN TRADE, 1958-59:

Portuguese fishing companies operating the fixed tuna traps or nets in the southern Province of Algarve complained that the tuna catch was poor in 1959. However, tuna catches by the two modern high-seas vessels (table 1), and the fleet of small boats in Madeira and the Azores were reported to have been better in 1959 than in 1958.

Table 1 - Tuna Catch by Two Modern Portuguese High-Seas Vessels, 1958-59

Vessel Name and Country of Landing	1959			1958		
	Quantity	Value		Quantity	Value	
	Metric Tons	1,000 Escudos	US$ 1,000	Metric Tons	1,000 Escudos	US$ 1,000
"Rio Agueda":						
Italy	371	3,271	114	-	-	-
Portugal	321	2,154	74	282	1,802	63
Total	692	5,425	188	282	1,802	63
"Rio Vouga":						
Italy	356	3,293	114	598	4,336	150
Portugal	265	1,746	61	-	-	-
Total	621	5,039	175	598	4,336	150

Note: Dollar values computed at rate of one escudo equals US$0.0347.

The fleet of small boats operating off the Azores landed about 5,239 metric tons of albacore tuna, valued at 9,980,000 escudos (US$346,306), in 1959. This compares with 2,620 tons, valued at 5,179,000 escudos (US$179,711) in 1958, and 5,470 tons, valued at 12,743,000 escudos (US$442,182), in 1957. The ex-vessel price for tuna in Portugal is often set before the catch has been made, and consequently varies considerably depending on location. Canneries in the Azores purchased tuna at the average price of 1.90 escudos a kilogram (US$60 a short ton), while canneries in Algarve paid 6.71 escudos a kilogram (US$211 a short ton) to the tuna clippers.

The pack of canned tuna on the Portuguese mainland declined from 2,626 metric tons in 1958 to 1,863 tons in 1959; however, canned tuna production in 1959 increased in Madeira and the Azores (table 2).

Table 2 - Portuguese Pack of Canned Tuna and Tunalike Fish, 1958-59

Type	Portugal (Mainland)		Madeira		Azores		Total	
	1959	1958	1959	1958	1959	1958	1959	1958
	(Metric Tons)							
Tuna & Tunalike:								
Oil or sauce	1,845	2,589	473	187	2,177	1,212	4,495	3,988
In brine	18	37	70	11	-	-	88	48
Total	1,863	2,626	543	198	2,177	1,212	4,583	4,036

Portugal's total exports of canned tuna in oil, sauce, or brine increased from 3,072 tons valued at US$2.1 million in 1958 to 4,012 tons valued at US$2.8 million in 1959. In 1959 Italy received the bulk of Portugal's canned tuna in oil or sauce and the United States received the second largest amount (see table 3).

Table 3 - Portugal's Exports of Canned Tuna and Tunalike Fish, by Country of Destination, 1959

Country and Type	1959		
	Quantity 1/	Value	
	Metric Tons	1,000 Escudos	US$ 1,000
In Oil or Sauce:			
United States	1,007	20,251	703
West Germany	14	300	10
Italy	2,273	45,724	1,586
United Kingdom	7	140	5
Belgium-Luxembourg	96	1,941	67
France	19	382	13
Switzerland	72	1,447	50
British East Africa	4	88	3
Netherlands	1	20	1
Belgian Congo	22	444	15
Greece	2	38	1
Portuguese Overseas	26	528	18
Sweden	1	21	1
Mexico	16	316	11
Venezuela	304	6,076	211
Australia	6	132	5
Canada	8	166	6
Jordan	1	19	1
Other	63	1,259	44
Total	3,942	79,292	2,751
In Brine Total	70	1,401	48
Grand Total	4,012	80,693	2,799

1/Net weight excluding cans and containers.
Note: Dollar values converted at rate of one escudo equals US$0.0347.

In 1958, Portugal's imports of tuna (fresh, frozen, slightly salted, and in brine) amounted

Portugal (Contd.):

to 1,929 tons valued at US$446,000--this compared with 1.234 tons valued at US$274,000 in 1959, according to a June 7, 1960, U. S. Embassy, Lisbon, report.

Table 4 - Portugal's Fresh, Frozen, and Salted Tuna Imports, 1958-59

Type & Country of Origin	1959			1958		
	Quantity	Value		Quantity	Value	
	Metric Tons	1,000 Escudos	US$ 1,000	Metric Tons	1,000 Escudos	US$ 1,000
Tuna, Fresh or Frozen 1/:						
Angola	-	-	-	32	165	6
Cape Verde Is.	168	534	19	133	475	16
Total	168	534	19	165	640	22
Tuna, Simply Salted:						
Morocco	265	1,670	58	853	5,342	185
Tangier	543	3,282	114	543	3,224	112
Portuguese Overseas	130	950	33	134	623	22
Other Countries	4	24	1	-	-	-
Total	942	5,926	206	1,530	9,189	319
Tuna, Salted in Brine:						
Portuguese Overseas	100	1,347	46	222	3,007	104
Spain	28	117	4	12	25	1
Total	128	1,464	50	234	3,032	105
Grand Total	1,238	7,924	275	1,929	12,861	446

1/September through January landings.

Senegal

TUNA INDUSTRY PROSPECTS AND PLANS FOR 1960/61 SEASON:

Representatives of the Senegalese Government, the tuna industry, and French Government and industry people held discussions September-October 1960 to determine the role of France in the 1960/61 Senegal tuna season. The discussions ended in mid-October.

In effect, the requests made by the Senegalese upon the French have been granted. France has agreed to purchase 10,000 metric tons of canned tuna and 5,000 tons of frozen tuna this coming year--3,500 tons more than last year. France has also agreed to limit her fleet to 55 clippers and 16 freezerships. Of the clippers, 5 or 6 will remain after the others return to France and perhaps transfer registration to Senegal. In addition, Senegal hopes to be able to purchase about 5 clippers during the coming season.

The 1960/61 season will run from November 15, 1960, to July 15, 1961. However, this lengthened period will apply only to Senegalese clippers, as the French fleet will return to France at the usual time, around the end of April 1961.

The Dakar canners have accepted the idea of reducing both costs and profits to increase export sales. They have also readily submitted to the plan of selling ten-fourteenths of their canned tuna to France at a guaranteed French price under the condition that four-fourteenths is sold to non-French markets at the world price.

The only factor not yet settled is the attitude of the fishermen themselves on the matter of selling four-fourteenths of their fresh catch at world price levels. Apparently they have not yet agreed to cooperate.

This drive to lower costs would result in expected sales of 4,000 tons of canned tuna to the export market, consisting mostly of the United States and the Common Market countries of Europe; 6,000 tons of frozen tuna are also being exported, the greater part to the United States by prior agreement with a California tuna canning firm.

Meanwhile, long-range plans remain as they are. The fishing pier in the port of Dakar is a certainty, and the construction of a California-type cannery thereon is still expected, though the money for the construction has not been received to date.

Activity on the part of the Senegalese Fisheries Service and the local tuna industry (which catches what the French call "albacore" but is really "yellowfin" tuna) has picked up considerably.

Plans for the tuna industry in Senegal are made with the idea of creating an industry independent of France and her financial support, and not complementary to that country's tuna industry. However, it is well realized that the primary restraining factor is the high local cost of production, averaging 7 CFA francs a kilo (1.3 U. S. cents a pound) more than other markets, notably the United States, are willing to pay.

Thus, the objective of the 1960/61 season is to become competitive on the world market. The specific plan drawn up for this purpose contains the following features:

1. The tuna season will be extended beyond the 4 or 5 months of the past to around 8 months.

2. As the previous seasons had been determined by the French clippers which came here only during the off-season in France to catch a previously determined amount, reliance will be placed upon increasing the number of local clippers, which will be chartered in Europe and manned to a greater extent than before by Africans. These will remain in local waters after the French clippers, having fulfilled their contracts, return to France.

3. The local industry will be called upon to cut costs and profit to a minimum.

4. Special efforts will be made to increase sales to the export market, which will receive tuna specially labeled and canned for export, particularly for the United States. This, as well as point 3 above, will be brought about by compelling local industry to sell abroad--in other words, for each local producer to be allocated a part of the guaranteed French market, he will have to export a certain quantity to another country. This has been done in the past, but not with the desired success.

The new drive for the export market currently envisions 10,000 additional metric tons destined for outlets other than France--4,000 tons canned and 6,000 frozen. Thus the total catch for the coming season would be approximately 25,000 tons, or 7,500 tons more than last year. It should be noted that the local tuna canning industry is operating below capacity--its six canneries are equipped to process 30,000 tons, but in effect will be canning only 14,000 tons in the 1960/61 season. (United States Embassy, Dakar, October 14 and September 8, 1960.)

Spain

MARKET FOR CANNED ALBACORE TUNA IN UNITED STATES SLOW:

As canning activity in the Spanish fish-canning industry reached its annual peak in September 1960, the canners were faced with a critical situation in marketing canned albacore in the United States. In 1959, exports of albacore authorized from the Northwest zone of Spain to the United States totaled about 3 million pounds with a value of US$1,063,546. The exact amount of exports of canned albacore tuna to the United States for 1959 for all of Spain is not known. However, the total for the Northwest Zone represented more than 8 percent of the total volume of Spanish canned fish exports in 1959 and more than 10 percent of the total value. In 1960 it was evident that the orders for canned albacore were not forthcoming as they were in 1959. The 1960 lack of orders for Spanish canned albacore was in sharp contrast to the situation in 1959 and to the expectations of the canners prior to the start of the 1960 season, when predictions of doubling 1959 albacore exports to the United States were not uncommon.

The principal obstacle preventing acceptance of the Spanish canned albacore was reportedly the abundance and low price of Japanese tuna available in the United States market. According to a local source, Japanese tuna was being offered in 1960 c.i.f. New York at US$19.00 (and sometimes less) per case of 12 66-oz. cans. The lowest price (including freight only) quoted in October 1960 for the Spanish product was $20.25 and found no buyers. Spanish canners claim they can offer no lower price without losing money. There are, however, indications that further offers will be made at lower prices, although it is doubtful that they will be able to meet the Japanese price. One Spanish producer stated that he had an offer from an American importer for all the albacore he could produce at $18.00 per case of 12 66-oz. cans, but that there can be no question of selling at such a price.

The high cost of Spanish tuna production, which caused Spain's inability to compete in the United States market in 1960, results from the high cost of the fresh fish and inefficiency in production and marketing. Albacore sold during July 1960 in Vigo, ex-vessel, at an average price of 17.12 pesetas per kilo (about US$259 a short ton) as compared with 13.92 pesetas per kilo (US$210 a short ton) in July 1959. In 1959, canners informally agreed to refuse to pay excessive prices for albacore and were able, for a period at least, to hold prices down. In 1960, the relative scarcity of albacore in comparison with the intense demand created by the anticipation of high exports to the United States held prices up for an extended period, and prevented any possibility of an informal agreement among canners, such as was reached in 1959.

Production costs are further elevated by antiquated machinery and frequently inadequate cold storage and sanitation methods--a situation which necessitates special and costly handling of fish to be processed for export to the United States. As for marketing, it is a matter of every producer for himself. There is no attempt to cooperate either in the establishment and development of markets or in the promotion of the Spanish product. A recent query by the National Fish Syndicate on how the sale of Spanish exports to the United States might be increased resulted in the suggestion that the industry form a marketing cooperative. According to suggestions, published by the canners' trade journal Industrias Conserveras, the cooperative marketing organization should promote one brand name for all Spanish tuna in the United States and would have the advantage of making low-interest credit more readily available to the industry and of securing cheaper freight rates. Furthermore, it would facilitate the importation of machinery, equipment, and raw materials, etc., at lower prices than presently available to the individual producer. Lastly, funds raised by the organization from among the individual members would permit extensive and effective promotion of Spanish canned fish in the United States market.

For 1960, it seemed likely that the canners would continue to hold back, waiting for a break in the United States market, and if this did not materialize, the canners would probably lower their prices by degrees until at least some of their stocks move. The special export operation for the Northwest Zone reports that an effort was being made in October 1960 in conjunction with the Cantabrian Zone to come to an agreement on a lower price for albacore exports. The results of this effort are not known.

In addition to the problem of the United States market, Spanish canned goods are reportedly meeting severe competition in Europe from Morocco and Portugal. Furthermore, present difficulties in Cuba have virtually dried up purchases by that country, traditionally one of Spain's best customers. Although hopeful that "something will turn up," local canners are fearful that 1960 may be as unfavorable an export year as 1959 was favorable. (United States Consul in Vigo, October 10, 1960.)

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VIGO FISHERIES TRENDS, JULY-SEPTEMBER 1960:

Fish Exchange: A total of 20,425 metric tons of fish were landed during the third quarter of 1960, over 45 percent more than the 13,923 tons of the previous quarter and about 5 percent less than the 21,636 tons of the third quarter of

Table 1 - Landings of Principal Species at Vigo, Spain, July-September 1960 with Comparative Data

Species	1960						1959		
	July-September			April-June			July-September		
	Qty.	Av. Price		Qty.	Av. Price		Qty.	Av. Price	
	Metric Tons	Pesetas Per Kilo	US$ Per Lb.	Metric Tons	Pesetas Per Kilo	US$ Per Lb.	Metric Tons	Pesetas Per Kilo	US$ Per Lb.
Sardines	3,619	4.39	.03	1,482	7.07	.05	5,574	4.84	.04
Albacore	3,351	17.30	.13	754	17.41	.13	4,230	14.52	.11
Horse mackerel	2,779	3.72	.03	2,457	3.56	.03	2,725	3.69	.03
Small hake	2,531	23.19	.18	1,694	21.22	.16	2,151	24.26	.18
Large hake	203	61.76	.47	234	43.75	.33	296	56.72	.43

Note: Values converted at rate of one peseta equals US$0.01666.

Spain (Contd.):

1959. The respective values were 221,342,972 pesetas (US$3,689,049); 131,425,626 pesetas (US$2,190,427); and 223,376,888 pesetas (US$3,723,000).

Canning: Fish canning moved into peak activity during the third quarter of 1960 as large supplies of sardines and albacore tuna provided raw material for the two principal products of the Galician canning industry. Albacore tuna was less plentiful than in 1959, which had been a poorer year than 1958; prices at first sale during the quarter averaged more than 17 pesetas per kilo (US$0.13 per pound), substantially above the third quarter of 1959. Sardines, while plentiful, were very small, with large quantities reportedly smaller than the legal minimum of 11 centimeters (approximately 4 inches). However, canners bought them for lack of larger sizes and at a price that compared favorably with the prices paid in 1959.

Unloading sardines from the hold of a Spanish sardine auxiliary craft.

Canners purchased 5,085 tons of fish during the third quarter of 1960 as compared with 6,575 tons during the same quarter of 1959. This represents about 25 percent of the total catch for the quarter as compared with about 30 percent in 1959.

In addition to the increased price of albacore, the canners encountered higher costs for olive oil and tinplate. Domestically-produced tinplate increased in price by 15 percent from August 1959 and up 56 percent from 1957. Canners attributed these increases to the excessive protection provided by the new duties promulgated in June. Duties on imported tinplate do not affect canning production for export since the canners enjoy the system of temporary admissions for tinplate to be re-exported. Production for export accounts for approximately 30 percent of national production.

Olive oil prices which were at 22.50 pesetas per liter (38 U.S. cents for about 1.1 gals.) last year are currently at 25 pesetas a liter (42 U.S. cents). Approximately 75 percent of all fish canned in Spain are packed in oil and the price therefore is of considerable importance in production costs.

Exports: The Galician fish canning industry is encountering unforeseen difficulties in exporting its production of canned fish. The most difficult situation is in the export of canned albacore tuna to the United States. Spanish canners find themselves unable to meet Japanese competition. The increased cost of albacore at the Vigo exchange is regarded as the principal factor in raising costs over last year. However, inefficient fishing methods and inadequate cold-storage facilities also have resulted in noncompetitive production costs for export to the United States.

Exports to European markets are also reported to be meeting severe competition from Portuguese and Moroccan products, while exports to Cuba have virtually dried up.

Thailand

DUTY LOWERED ON FISH MEAL:

Fish meal is included in a list of 14 items on which duties have been lowered by Thailand in order to promote industrial and agricultural enterprises. Fish meal (Item No. 23.01) for animal consumption can now be imported into Thailand at a duty rate of 10 percent ad valorem as compared with the old rate of 27.5 percent. (Foreign Commerce Weekly, November 14, 1960).

Union of South Africa

FISHERY PRODUCTS EXPORTS NOT AFFECTED BY BOYCOTTS:

The official boycotts of South African goods by Ghana and Malaya have not had a noticeable effect on the export of canned fish from the Union of South Africa. An unprecedented demand from the Philippines and higher sales to the United Kingdom have more than compensated for the losses. Available statistics show that the value of canned pilchards or sardines and other fish exported in the first five months of 1960 was £2,996,551 (US$8,378,000) as compared with £1,804,116 ($4,431,000) in the same period last year. Dried and cured fish exports also rose in volume and value, although the Ghana market for dried shark is lost ($56,000-70,000). The Congo market for over £300,000 ($839,000) annually of dried hake is uncertain.

The depressed state of world fish-meal prices by Peruvian competition can be seen in the fact that, while the Union's volume of fish meal and solubles exported in the January 1-May 30 period rose by 33 percent over the 1959 period, the value of the goods rose only 12.8 percent. (United States Embassy in Pretoria, October 18, 1960.)

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FISHING FIRM TRIES LONG-LINING FOR TUNA:

The encouraging results of long-line tuna-fishing tests made by the South African Division of Fisheries Research vessel Kunene and a privately-owned motor trawler Cape Point aroused considerable interest in the fishing industry and at least one fishing firm was expected to try this method of tuna fishing in September 1960.

Union of South Africa (Contd.):

According to an official of the company, Japanese long-line gear had been acquired and was to be tried on a new 69½-foot long motor fishing vessel Brazil. With a factory on the St. Helena Bay coast equipped for drying and freezing, the firm hopes to process the catch in an attempt to start a commercial tuna fishery. The new vessel is one of the largest boats in the pelagic shoal fishery. She is powered by a 290-hp. Diesel engine. (South African Shipping News and Fishing Industry Review, September 1960.)

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PELAGIC FISHING SEASON ENDED IN JULY WITH RECORD LANDINGS:

The Union of South Africa's Cape west coast pelagic fish landings at the end of July 1960, when the season closed, totaled 350,361 short tons of pilchards, 45,800 tons of maasbanker, and 27,363 tons of mackerel. The total pelagic landings were a record 423,520 tons and the pilchard-maasbanker total was 396,161 tons. In 1959 landings of pilchards and maasbanker over the same period were 323,499 tons; in 1958 the total was 271,323 tons.

In the 1960 season, the Union's west coast fishing industry produced 90,204 short tons of fish meal, 6,080,281 gallons of fish-body oil, and 29,984,227 pounds of canned fish, including 5,997,363 pounds of canned pilchards, 15,911,580 pounds of maasbanker, and 8,075,284 pounds of mackerel.

The July 1960 landings were 85,695 tons of pilchards, 883 tons of maasbanker, and 10 tons of mackerel, totaling 86,588 tons. These figures compare with 65,175 tons of pilchards, 104 tons of maasbanker, and 48 tons of mackerel in July 1959; and with 25,613 tons of pilchards, 1,109 tons of maasbanker, and 1,151 tons of mackerel in July 1958. The July 1960 landings yielded 20,392 tons of fish meal, 549,434 gallons of fish-body oil, 3,062,365 pounds of canned pilchards, and 279,115 pounds of canned maasbanker.

The South-West African Walvis Bay pelagic fish catch to the end of July totaled 203,952 short tons.

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TUNA RESEARCH AND COMMERCIAL POSSIBILITIES:

Exploratory fishing for tuna has been conducted along the coasts of the Union of South Africa since November 1959 and is continuing. The research is being undertaken by the South African Museum and the Department of Commerce and Industries' Division of Fisheries. Results as of mid-November 1960, according to those conducting the research, were "very promising." Three commercial fishing companies have indicated varying degrees of interest. One of the three, at least, will attempt in 1961 to enter the United States market with shipments of frozen tuna to canneries.

Tuna fishing at present in South Africa is confined to rod-and-line fishing for sport. Some 20 privately-owned tuna boats operate out of the Cape Peninsula area. No tuna is canned commercially. The numbers of tuna caught in the last two seasons, and the excellent catches as of November 1960 have aroused the interest of the Division of Fisheries of the Department of Commerce and Industries, as well as others.

In November 1959, the Division of Fisheries began systematic exploratory fishing for tuna from Cape Columbine, on the Atlantic Coast about 80 miles north of Cape Town, to Cape Point. The vessel used, the Kunene, is a fisheries research vessel similar in design to the usual wooden pilchard boats. In addition to locating the tuna, the intention has been to work out methods whereby the pilchard boats could be used in the pilchard off-season, and to train pilchard fishermen to use the Japanese long-line gear which has been used throughout the search.

The Director of the Division of Fisheries states that the average rate of fish caught per 100 hooks per day during the winter months (June, July, August) has been between 20 and 30. (It is understood that, according to Japanese long-line experts, a catch rate of 7 per 100 per day is considered good, i.e., commercially-profitable within their cost structure.) While the Director also stated that daily catches as high as 90 fish per 100 hooks had been recorded during this period, he added he did not believe that "one swallow makes a summer" and he intends to pursue the search "indefinitely." He is optimistic about establishing tuna as part of the fishing industry, at least to employ craft outside of the pilchard season.

In February 1960 a large South African fishery firm placed one of its trawlers, the Cape Point, at the disposal of the South African Museum for the study of tuna migratory movements from Cape Columbine to East London. The boat is loaned for 10 days each month until August 1961. As the Division of Fisheries is already covering part of this area, the Museum has made its major effort in the area due west of the Cape Peninsula, as far as 100 miles out into the Atlantic. (As the waters from Cape Point to East London are considered too poor to yield much, that area is covered only quarterly.) In the Cape Peninsula area, the chief of the Museum project states, the average summer daily catch rate was 8 fish per 100 hooks and the average winter daily rate was 20 fish per 100 hooks. With the gear used, 100 hooks covers 5 miles, at depths from 17 to 70 fathoms.

One South African fishery firm from Stompneus Bay, Cape Province, announced to the press in late October 1960 that it was assigning a pilchard boat to catching tuna full time because of the results obtained by the Division of Fisheries. The company announced hopes of edging into the foreign market, especially by selling frozen tuna to Italy. Other companies report this effort has been unsuccessful to date; the firm reportedly tried to sell its tuna catch to a large Cape wholesale fish merchant.

A second larger commercial fishing and canning organization intended to bring three pilchard boats down from South-West Africa in January 1961 to fish for tuna below Cape Columbine. The company has already approached the Farrell Lines about refrigeration space to the United States and was negotiating with United States canners.

Union of South Africa (Contd.):

Another large South African fishery firm, according to information received from sources outside the company, intends to export frozen tuna, and most probably will sell to United States canners. According to these reports the company is only waiting until a satisfactory marketing arrangement can be effected. A company spokesman, on the other hand, stated it would be at least a year before the company would decide what to do about the results of the Museum's current research. He disparaged the idea of using wooden pilchard boats for tuna because of their lack of range, refrigeration facilities, and seaworthiness, and compared them unfavorably with the specialized and expensive Japanese boats which have visited Cape Town. (United States Consulate, Cape Town, November 15, 1960.)

U. S. S. R.

EXPERIMENTS ON TRANSPLANTING PACIFIC SALMON IN ATLANTIC OCEAN SUCCESSFUL:

Norwegian fishermen in the Varanger area of Northern Norway adjacent to Russia have recently been catching pink salmon (popularly called "Russian" salmon), according to Fiskets Gang (October 5, 1960), a Norwegian fishery trade periodical. (Original source was the Russian newspapers Sovjetskaja Rossia for July 5 and Sovjetskij Flot for August 26).

Along the Kola Peninsula and in adjacent ocean areas, including the Norwegian coast, there now have been 30,000 instances of salmon (Oncorhynchus gorbuscha), taken by fishing gear. As long ago as in the 30's the first attempts were made to plant Pacific salmon in the Murmansk fjord after Soviet researchers had determined that the hydrological conditions in the Barents Sea and the White Sea were similar to those in far eastern waters. The first attempt failed. In 1956, however, the attempts succeeded. At that time 2.4 million fertilized eggs of pink salmon (Oncorhynchus gorbuscha) and chum salmon (Oncorhynchus keta) from the Sakhalin (Siberia) area were transferred but it proved insufficient. In the Murmansk district the special hatcheries were expanded. In 1957, 13 million eggs were transferred; in 1958, 19 million; and in 1959, 21.6 million. For the first time in history, a species of salmon was transplanted successfully from one ocean to another[1]. Conditions in the Barents Sea and the White Sea proved to be especially favorable for these salmon. The length of the mature pink salmon caught along the Kola Peninsula is from 30 to 52 centimeters (11.8-20.5 inches) and weight is over 1.5 kilos (3.3 pounds). In the Pacific Ocean they seldom weigh over 1.2 to 1.3 kilos (2.6-2.9 pounds).

1/Editorial Note: Striped bass and shad were transplanted successfully from the United States Atlantic Coast to the Pacific Coast many years ago.

In the fall of 1960 an additional 35 million pink and chum salmon eggs were transported by plane from Sakhalin and Kamchatka. At the same time the industry in Murmansk expected to handle eggs from the existing local species.

A portion of the eggs will be hatched out in hatcheries which are on rivers on the Kola Peninsula; the remainder will be handled in hatcheries on rivers which flow into the White Sea. The purpose of this test is to determine where these new salmon species thrive best.

The chairman of the economic council for the Murmansk region, who signed the article in Sovjetskaja Rossia, concluded that the time was not distant when Pacific Ocean salmon would be the object of a fishery in the Murmansk area.

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HERRING TRANSPLANTED FROM BALTIC TO ARAL SEA:

The successful transplantation of herring was reported by the Russians at the recent meeting of the International Council for the Exploration of the Sea held in Moscow, according to a report in Fiskaren (October 5, 1960), a Norwegian fishery trade periodical. The roe of herring was transferred from the Baltic Sea to the inland Aral Sea which has a salt content similar to that of the Baltic Sea. There is now a fishery for herring in the Aral Sea that has developed from the transplanted eggs.

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SEAWEED PROCESSING PLANT PLANNED FOR WHITE SEA AREA:

The Soviet Union's plans for constructing a large factory at Belomorsk for utilizing the seaweed resources along the Karelian coast of the White Sea were reported in Vodnyj Transport (October 22, 1960), a Soviet periodical, according to the November 10 Fiskets Gang, a Norwegian fishery trade periodical. The plant will be one of the Soviet Union's largest in this area with a raw material ca-

U.S.S.R. (Contd.):

pacity of 3,000 metric tons annually. It will manufacture products for the textile and oil industries, animal fodder, and padding for the furniture industry.

In addition, there are plans to build a special vessel for mechanical cutting and collecting of the marine algae from the sea to a depth of four meters (about 13 feet). Both the vessel and the factory are still on the drawing boards.

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WOMAN SERVES AS CAPTAIN ON LARGE FISHING TRAWLER:

The large Soviet factory trawler Novikov Priboj was in a shipyard in Kiel, West Germany, in October 1960 for overhauling, according to Dansk Fiskeri Tidende (October 14, 1960), a Danish fishery periodical. The vessel is one of a series of 24 trawlers of the Pushkin class (2,450 gross tons) which the shipyard constructed four years ago for Sudoimport in Moscow.

The vessel's captain is a 45-year-old woman. She is from Western Siberia and originally intended to become a ship construction engineer. During her studies at the University in Leningrad she worked on a ship and from 1939 to 1947 went through prescribed courses for education as a seaman. The female captain started on a sailing vessel as a regular "ship's boy." When she was 33 she received her license as captain. Since then she has commanded ships successfully, including whale catchers. She has taken excellent catches on the factory trawler, which has a crew of 100.

United Kingdom

FISHERY LOANS INTEREST RATES REVISED:

The British White Fish Authority announced effective October 10, 1960, as a result of changes in the rates of interest charged to them by Her Majesty's Treasury, that rates of interest on loans made will be as follows:

For fishing vessels of not more than 140 feet, new engines, nets, and gear:

On loans for not more than five years--$6\frac{1}{2}$ percent (decrease $\frac{1}{4}$ percent).

On loans for more than five years but not more than 10 years--$6\frac{5}{8}$ percent (decrease $\frac{1}{8}$ percent).

On loans for more than 10 years but not more than 15 years--$6\frac{5}{8}$ percent (no change).

On loans for more than 15 years--$6\frac{3}{4}$ percent (no change).

British "middle water" trawler or lugger approaching dock at Grimsby, England.

For processing plants:

On loans for not more than 20 years--7 percent (no change).

The rates on loans made before October 10, 1960, remain unchanged (Fish Trades Gazette, October 22, 1960.)

Note: See Commercial Fisheries Review, October 1960 p. 88.

* * * * *

IMPORTS OF CANNED SALMON FROM RUSSIA INCREASED:

More than £1,000,000 (US$2,809,000) are involved in new quotas and licenses for Russian canned salmon imports to Britain. Half the amount, £550,000 (US$1,545,000), is included in the quotas for consumer goods to be traded between Britain and Russia in the year ending June 30, 1961.

Licenses for a further £550,000 worth of canned salmon will also be issued under arrangements made outside the Consumer Goods Agreement. In addition, canned crab meat will be imported from Russia to the value of £440,000 (US$1,236,000).

United Kingdom (Contd.):

The salmon and crab meat quotas under the agreement, totaling £1,540,000 (US$4,326,000), are each the biggest ones for Russian goods.

White fish to the value of £550,000 is to be exported by Britain to Russia, also £175,000 (US$492,000) worth of herring--the largest quota of British goods for export to Russia.

The quotas for all products to be traded between the two countries total £2,850,000 (US$8,006,000) f.o.b. in each direction. The Soviet quotas have been raised by 10 percent to give the c.i.f. equivalents. They were arranged in accordance with the Anglo-Soviet Trade Agreement of 1959.

* * * * *

SHRIMP INDUSTRY AND FOREIGN TRADE:

In the United Kingdom, shrimp are fished by fishermen-owned vessels, each working in an individual pattern, which includes other forms of fishing as an alternative.

Two species of shrimp are caught in commercial quantities in England and Wales, the pink shrimp (Pandalus montagui, Leach) and the brown shrimp (Crangon vulgaris). The normal method of fishing is by beam trawl from inshore vessels--mainly 20-40 feet in length. A small amount of shrimp fishing is done by push net. The shrimp are boiled in salt water on board the vessel and sold either to the fresh market or processing firms.

Sorting of shrimp may take place either where there are group sorting facilities, or in outworkers' premises, provided these are registered under Food Hygiene Regulations.

The principal shrimp grounds are located in the Wash and Thames Estuary on the east coast and in Morecambe Bay on the northwest coast of England. The season for pink shrimp normally lasts from April to December, while brown shrimp can be caught all year round.

Four firms have special equipment for processing shrimp, mainly for freezing, canning, and paste manufacture. Only one firm possesses a peeling machine. The industry is on a small scale and greater mechanization is not anticipated.

The total annual landings of shrimp for the years 1956-59 (England and Wales) are shown in table 1.

There is little or no new construction for vessels which only pursue shrimp trawling. It was reported on September 16, 1960, that bad weather and a shortage of marine food two years ago was the cause of the worst season for Harwich shrimp vessels. The Harwich fleet, once the largest on the East Coast, has dwindled to a handful of vessels and a further reduction is anticipated in 1961. Total catches in a full working day in 1960 have been down to 20 Imperial gallons and the shop shrimps have reached the record price of 1s. 9d. (24.5 U. S. cents) a pint.

Table 1 - Shrimp Landings in England and Wales, 1956-59[1/]

Year	Quantity	Value	
	1,000 Lbs.	£1,000	US$1,000
1959	4,033	166	467
1958	4,460	196	551
1957	5,043	213	597
1956	4,623	190	533

1/Heads-on shrimp landed by British flag vessels.
Note: Currency converted at rate of one pound equals US$2.8094

Table 2 - United Kingdom's Shell Fish[1/] Exports, 1955-58

Year	Quantity	Value	
	1,000 Lbs.	£1,000	US$1,000
1958	678	287	2,212
1957	681	322	903
1956	589	291	818
1955	584	240	674

1/Presumably includes shrimp.

Table 3 - United Kingdom's Shellfish Imports, 1955-58

Product & Origin	Year	Quantity	Value	
		1,000 Lbs.	£1,000	US$1,000
Shellfish, fresh (not in airtight containers)[1/] incl. edible snails--chiefly from Netherlands, Denmark, & Germany.	1958	9,833	194	546
	1957	10,683	215	603
	1956	10,464	211	595
	1955	13,080	184	517
Shellfish, frozen[1/]--chiefly from Norway, China, Japan, and Iceland	1958	3,281	921	2,587
	1957	1,983	484	1,360
	1956	1,391	339	951
	1955	1,012	252	707
Fish (including shellfish) in airtight containers--prawns & shrimp, canned)[1/] chiefly from Norway, some from China.	1958	1,222	473	1,328
	1957	1,169	434	1,219
Fish & fish preparations, in airtight containers or not: fish (including shellfish) in airtight containers--fish pastes.	1958	145	43	121
	1957	139	37	103
	1956	445	113	317
	1955	275	81	227

1/This category did not exist prior to 1957.

United Kingdom (Contd.):

Payment to the vessels is on a share basis--the division of shares varying from port to port. Earnings of fishermen range between £400 to £900 annually (US$1,124 to $2,528).

Total exports of shellfish (including mollusks) from 1955 through 1958 are shown in table 2. The actual export of shrimp is believed to be small.

The United Kingdom's shrimp industry receives no direct governmental subsidy and is free of export controls. There are no export taxes.

No significant permanent expansion of the annual catch is likely, as the grounds are limited and the volume of the catch fluctuates. Many shrimp fishermen pursue other types of inshore fishing when they prove to be more remunerative. (United States Embassy in London, November 21, 1960.)

WHICH SIDE UP?

Grimm, the prolific writer of fairy tales so dear to the hearts of children a couple of generations ago, told of a talking flounder, but what has been said of flounders wearing dark undersides as well as top sides?

This question prodded fisherman G. A. Wright to bring to the Virginia Fisheries Laboratory at Gloucester Point an oddly colored flounder recently caught in York River near Sarah's Creek. Scientists at the Laboratory viewed with interest his freakish flatfish, which was colored equally dark on both the upper and lower sides, except for the head region on the blind side.

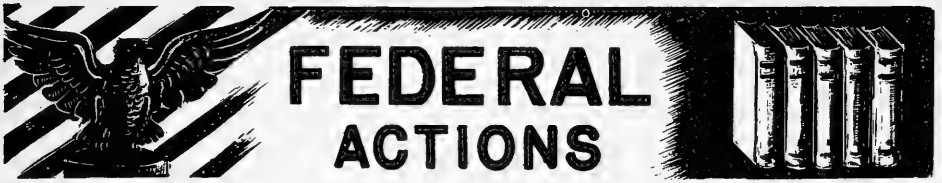
Numerous ambicolorate (colored on both sides) fish have been caught over a period of years, and although scientists have been fascinated by this departure from the normal, and have studied such unusual conditions, no one has satisfactorily explained how such an abnormality may come about.

J. R. Norman suggested in his history of fishes that flatfishes evolved from symmetrical fishes of the sea-perch kind, and almost invariably, fishes exhibiting dark coloration on the under sides are also different from normal fish in other respects. Often their parts are more nearly like their perch-like ancestors than are the ordinary run of flounders.

Norman relates two legends about flatfishes. The Arabs account for the dark-colored upper side and light "blind" side saying that Moses was once engaged in cooking a flatfish, and that when one side was brown the oil he was cooking it in gave out. This annoyed him and he threw the fish back into the sea. Although it was half cooked, it immediately came to life and its descendants have all been born browned on one side.

A Russian legend has it that the Virgin Mary heard the tidings of the Resurrection while eating a fish. Doubting the truth of the message, she flung the uneaten half of the fish into the water, bidding it, if the message were true, to come back to life whole. This, it immediately did, starting a breed of flatfish!

Many interesting experiments on color changes in flounder have been performed, and some investigators declare that it may change color in response to varied backgrounds in a manner that would put a chameleon to shame. This, however, does not account for the peculiar coloration of Wright's fish, for only the colored side of a normal fish may become darker or lighter with its surroundings. (Virginia Fisheries Laboratory, Gloucester Point, Virginia, News Release No. 224, June 24, 1958.)



Department of the Interior

FISH AND WILDLIFE SERVICE

FISHING VESSEL SUBSIDY EXCLUDED FROM MORTGAGE INSURANCE:

Federal funds provided under the Fishing Vessel Construction Differential Subsidy Act of 1960 for part of the cost of the construction of a fishing vessel cannot be included in the actual cost of the vessel for mortgage insurance purposes, the Department of the Interior announced on October 28, 1960. Amended regulations governing the mortgage insurance program were published in the Federal Register of November 1, 1960. The Mortgage Insurance Program and the Fishing Vessel Construction Subsidy Program are both under the jurisdiction of the U. S. Department of the Interior.

Under the construction differential legislation the Congress provided certain limitations which must be met before a prospective fishing vessel owner can qualify for a Federal subsidy. Under the mortgage insurance legislation a mortgage covering the financing of the construction, reconditioning or reconstruction of a fishing vessel may be insured--a program similar to that operated by the Federal Housing Administration for insuring loans on new homes.

Under the amendment to the insurance program regulations the amount of the insured mortgage will be based upon the actual cost to the fishing vessel owner, with the Federal subsidy excluded.

The amended regulations as published in the Federal Register follow:

Title 50—WILDLIFE

Chapter II—Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior

SUBCHAPTER F—AID TO FISHERIES

PART 255—FISHING VESSEL MORTGAGE INSURANCE PROCEDURES

Definition of "Actual Cost" of a Vessel

On page 8324 of the FEDERAL REGISTER of August 31, 1960, there was published a notice and text of a proposed amendment to Part 165, Title 50, Code of Federal Regulations. Part 165 now has been changed to Part 255 in keeping with the format of the revised edition of 50 CFR—Wildlife, published in the FEDERAL REGISTER of September 1, 1960. The purpose of the amendment is to change the definition of "actual cost" on which the amount of mortgage insurance may be based so as to exclude any cost paid by any Government Agency.

Interested persons were given 30 days within which to submit written comments, suggestions or objections with respect to the proposed amendment. No comments, suggestions or objections have been received, and the proposed amendment is hereby adopted without change. This amendment shall become effective at the beginning of the 30th calendar day following the date of this publication in the FEDERAL REGISTER.

As so amended paragraph (g) of § 255.2 reads as follows:

§ 255.2 Definitions.

* * * * *

(g) Actual Cost. The term "actual cost" of a vessel as of any specified date means the aggregate as determined by the Secretary of (1) all amounts paid by or for the account of the mortgagor or borrower on or before that date, and (2) all amounts which the mortgagee is then obligated to pay from time to time thereafter under a contract or contracts for the construction, reconstruction or reconditioning (including designing, inspecting, outfitting and equipping) of the vessels, provided such contract or contracts shall include, in addition to profit, only those items customarily included in such contract or contracts as contractor's items of cost, except where the Secretary finds that those charges are unfair or unreasonable; provided, however, that if any portion of the cost of the vessel is paid by any Government Agency as a subsidy, or otherwise, the amount of such payment will not be included in the "actual cost" as determined by the Secretary.

ROSS LEFFLER,
Acting Secretary of the Interior.

OCTOBER 26, 1960.

Department of State

MORE PUBLIC PARTICIPATION IN 1961 UNITED STATES TARIFF NEGOTIATIONS PROPOSED:

A plan for increased participation by non-governmental representatives in the United States Delegation to the 1961 Geneva tariff conference has been developed by the Trade Policy Committee. It will provide for the broadening of the practice of appointing public advisers and consultants to United States Delegations to tariff negotiations so that additional competent, representative, and diversified opinion from industry, agriculture, labor and the public may be available to the Executive Branch in all such negotiations, the Secretary of State announced on November 15, 1960.

In recent years it has been customary for the Secretary of State to appoint three or four private citizens as public advisers on the United States Delegations participating in the major meetings of the Contracting Parties to the General Agreement on Tariffs and Trade (GATT). The new plan provides

for an increase in the number of public advisers to a total of 12.

The advisers will be appointed by the Secretary of State upon recommendation by the Trade Policy Committee. The public advisers will serve on a rotating basis as members of the United States Delegation attending the tariff negotiations in Geneva commencing in January of 1961. The plan provides that the advisers will be informed of the detailed United States negotiating plans and the Government will have the benefit of any comments they may have.

In addition, the plan provides for the designation by the Chairman of the Trade Policy Committee of a substantial number of private citizens to be available in Washington as consultants to the Committee and its member Departments on questions arising in the course of the Geneva negotiations. The consultants will be designated by the Chairman of the Trade Policy Committee upon nomination by the Trade Policy Committee member Departments. They will be selected on the basis of their familiarity with the domestic economy and the effect of foreign trade upon it. While the consultants will not be members of the Delegation, they will be able to supply expert judgment on particular commodity groups or particular areas of economic activity and will make available to the Government a valuable source of technical judgment on problems arising in the course of the tariff negotiations.

This plan is in keeping with Section 3 (e) of the Trade Agreements Extension Act of 1958 which provides for information and advice from representatives of industry, agriculture, and labor during the course of international tariff negotiations and thus encourages the continuation and broadening of the previous practice in this respect.

U. S. Tariff Commission

SUBMITS PROPOSED UNITED STATES TARIFF SCHEDULES:

The final report on the Tariff Classification Study which includes the text of proposed United States tariff schedules was submitted by the Tariff Commission on November 15, 1960. The report, which comprises 10 volumes, is being submitted to the President and to the Chairmen of the Committee on Finance of the Senate and of the Ways and Means Committee of the House of Representatives. Legislation will be required to make the proposed tariff schedules effective.

The only rate changes included in the proposed schedules are those which are incidental to the accomplishment of the purposes of the study. The proposed schedules are logical and systematic in arrangement and incorporate a number of innovations and important features which should be of substantial assistance and benefit to importers, domestic producers, customs and other government officers, customs lawyers and brokers, and other interested persons.

The Tariff Act of 1930 is the last general tariff revision by the U. S. Congress. In that Act, as amended and modified, the rates of duty on dutiable articles are set forth in the first 15 schedules (Title I - Dutiable List) and articles exempt from duty are provided for in schedule 16 (Title II - Free List). There are, in addition, a number of provisions of law which, although not incorporated in the schedules of the Tariff Act, are nonetheless part of the existing tariff structure.

The proposed tariff classification provisions are organized into 8 schedules, in contrast with the present 16. Each of the schedules is, in turn, divided into parts and subparts. Provisions of general application (which are presently scattered throughout the statutes) together with principles and customs practices applied under established judicial precedent have been consolidated into a set of general headnotes and rules of interpretation which appears at the very beginning just ahead of schedule 1. Schedules 1 through 7 form the main body of the proposed tariff schedules, schedule 8 being devoted to special permanent classification provisions relating to the tariff treatment of articles exported and returned to the United States, personal exemptions, exemptions for Government agencies, exemptions for institutions, and articles released from customs custody under bond. An appendix to the tariff schedules, which includes temporary and collateral legislation and executive and administrative actions concerned with the treatment of imported articles, appears after schedule 8.

The approximately 250 schedule, part, and subpart headings of the proposed schedules, though not interpretive, provide in outline form an informative guide for the user.

An important feature not found in the existing schedules is a system of interpretive headnotes which specify special rules of interpretation, define terms, prescribe special procedures, and, in general, clarify the relationships between the various schedules, parts, and subparts and the classification descriptions incorporated therein.

The use in the proposed schedules of a tabular arrangement or system for the classification provisions, with the superior tariff descriptions subdivided into inferior descriptions, adds greatly to clarity and furnishes immediate answers to various questions concerning the relative specificity of provisions.

An extremely important innovation is the use of a 5-digit system of decimal numbering which provides a separate and distinct item number for each and every rate line in the proposed schedules. This 5-digit numbering system should facilitate the use of the schedules in a number of ways, not the least important of which relates to the collection of statistical data.

Note: The volumes of the final report are available for purchase, individually or in sets, from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Eighty-Sixth Congress

(Second Session)

Public bills and resolutions which may directly or indirectly affect fisheries and allied industries are reported. Introduction, referral to committees, pertinent legislative actions, hearings, and other actions by the House and Senate, as well as signature into law or other final disposition are covered.

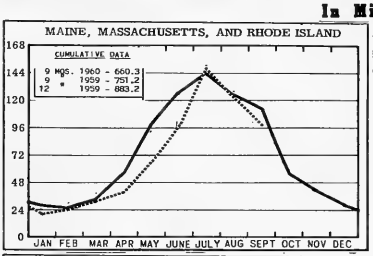
ALASKA FISHERIES TRANSPORT ACT EXTENSION: Inspection of Certain Small Vessels Carrying Freight (Hearing before the Merchant Marine and Fisheries Subcommittee of the Committee on Interstate and Foreign Commerce, United States Senate, Eighty-Sixth Congress, Second Session on S. 2669, a bill to extend the period of exemption from inspection under the provisions of section 4426 of the Revised Statutes granted certain small vessels carrying freight to and from places within the inland waters of southeastern Alaska, February 16, 1960), 61 pp., printed. This legislation is to allow unmolested and unrestricted use of small charter boats (converted fishing vessels) as general and refrigerated cargo carriers plying waters between Puget Sound and Alaska. These boats carry perishable foodstuffs to Alaska, and transport frozen and processed fish to railhead at Prince Rupert and Puget Sound. Contains letters, telegrams, and resolutions from government officials; officials of food corporations; various seafarers organizations; and other interested persons. Also contains summaries of casualties occurring since July 1957 on uninspected freight vessels of less than 150 gross tons engaged in trade between the United States northwest and southeast Alaska.

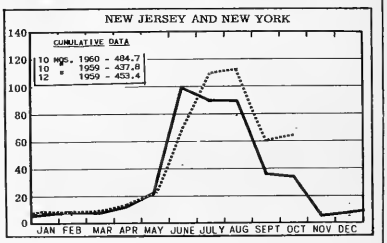
CANNING INTRODUCED IN UNITED STATES IN 1819

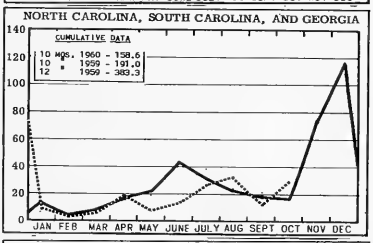
"Canning is said to have been introduced into the United States by Ezra Daggett and Thomas Kensett in 1819 when they packed oysters and other seafoods in New York. William Underwood is credited with establishing a plant in Boston in 1820, packing lobster and fruit in glass. It is understood that these men learned the art in England before emigrating to this country. The Underwood plant was later reorganized into the firm of Wm. Underwood's Sons . . ." (Principles and Methods in the Canning of Fishery Products, Research Report No. 7, page 2, U. S. Fish and Wildlife Service.)

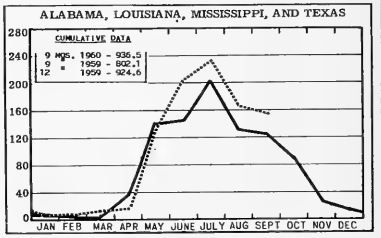
CHART I - FISHERY LANDINGS for SELECTED STATES

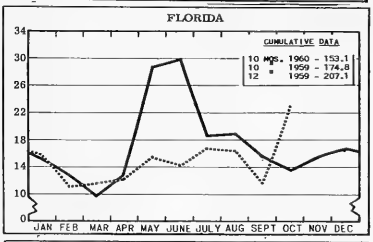
In Millions of Pounds

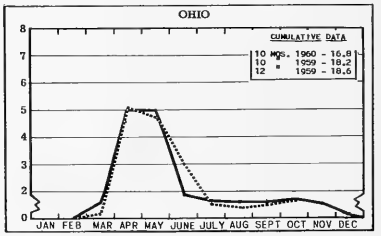


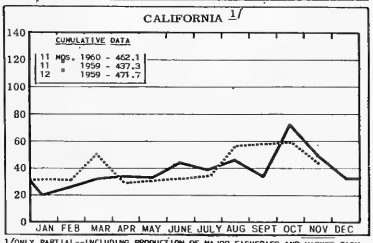


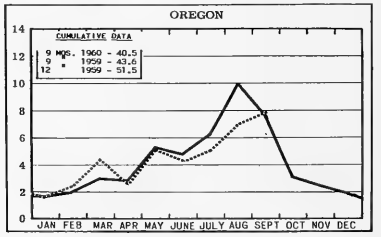








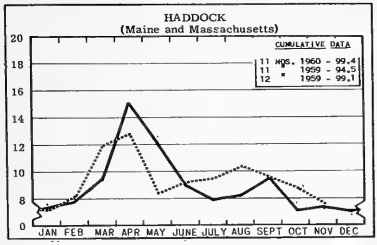




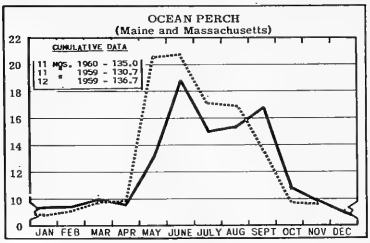
1/ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

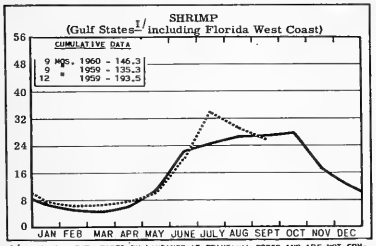
In Millions of Pounds

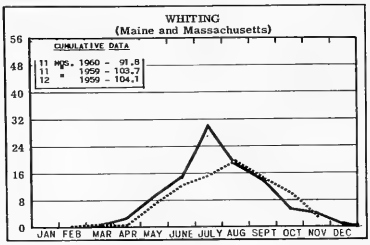


LEGEND:
1960
1959



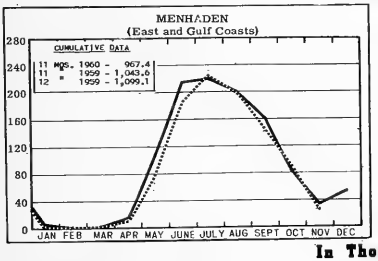
In Millions of Pounds

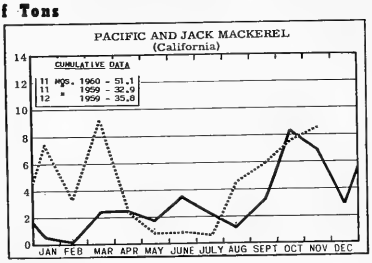




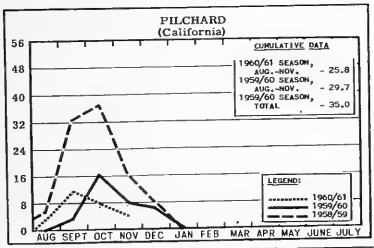
1/ LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons





In Thousands of Tons



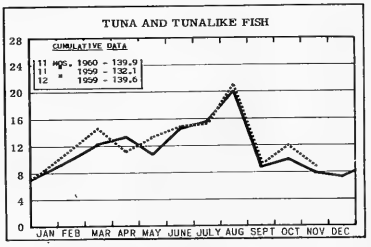
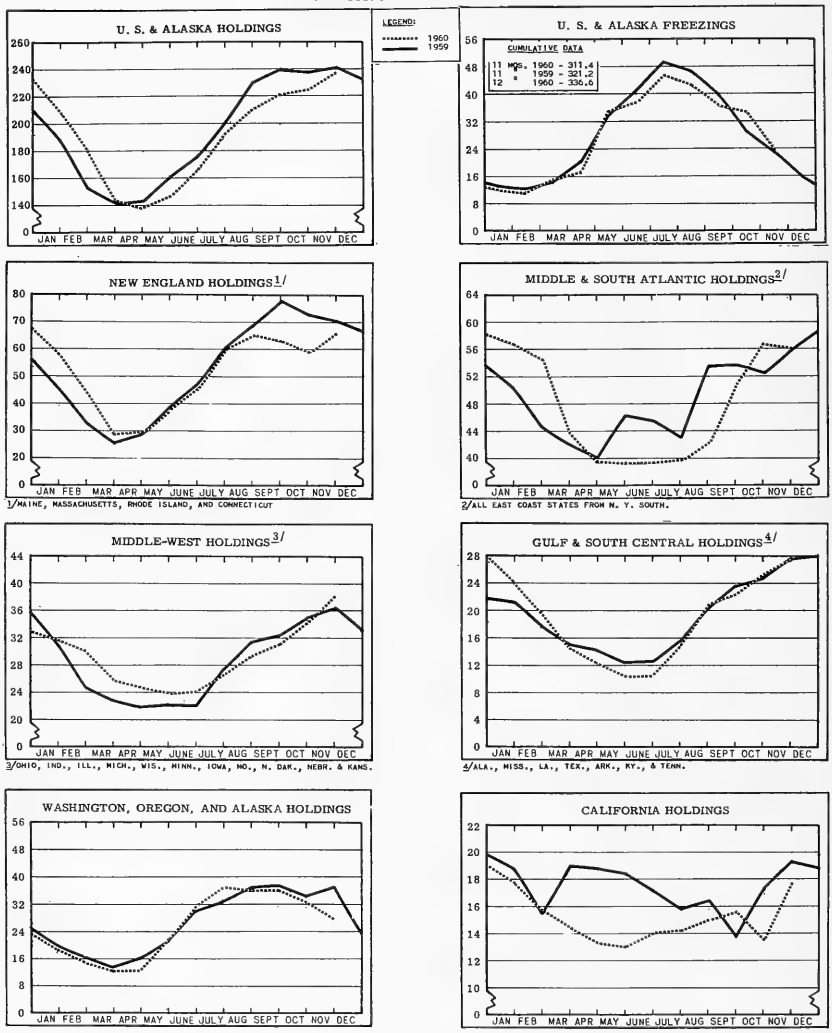


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

In Millions of Pounds



1/MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT

2/ALL EAST COAST STATES FROM N. Y. SOUTH.

3/OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR. & KANS.

4/ALA., MISS., LA., TEX., ARK., KY., & TENN.

* Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

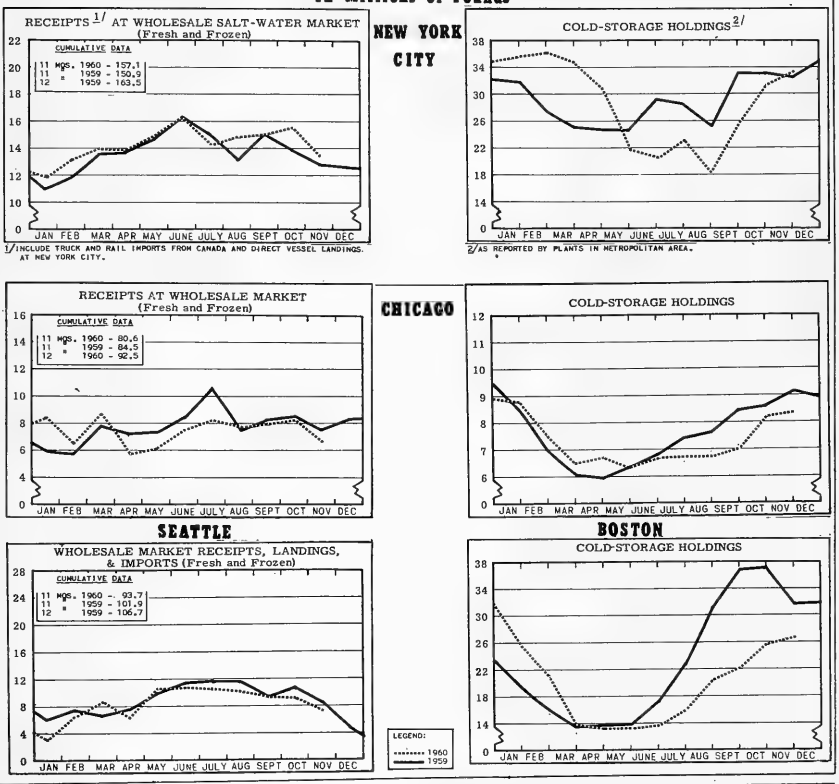


CHART 5 - FISH MEAL and OIL PRODUCTION - U.S and ALASKA

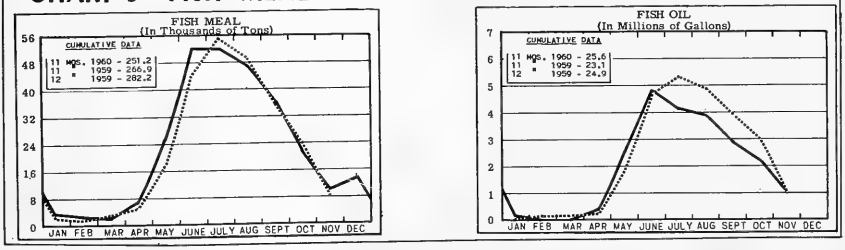
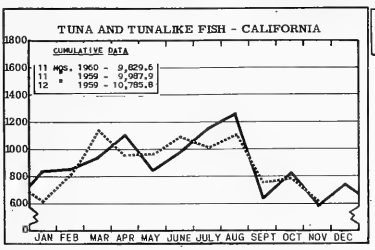
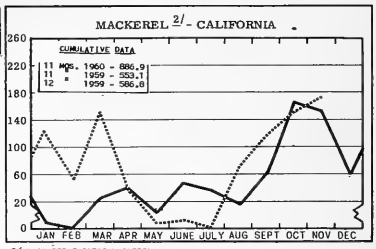


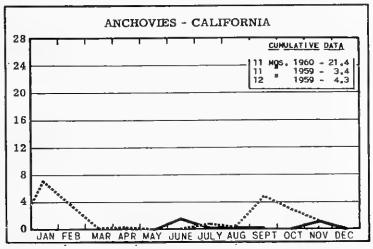
CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

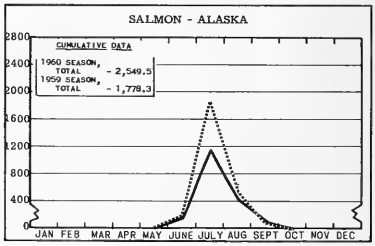
In Thousands of Standard Cases

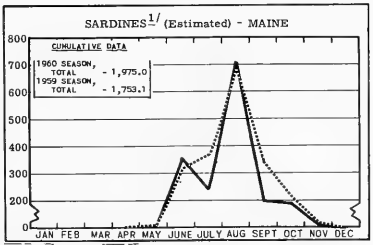




2/ INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



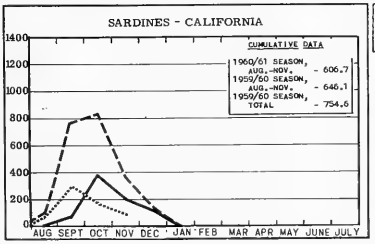




1/ INCLUDING SEA HERRING.

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	¼ drawn	3¾ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# ½ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	½-lb.	8 oz.



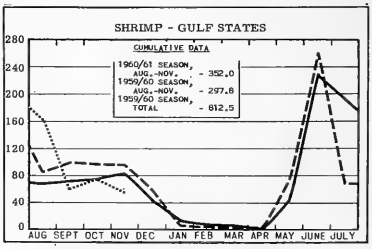
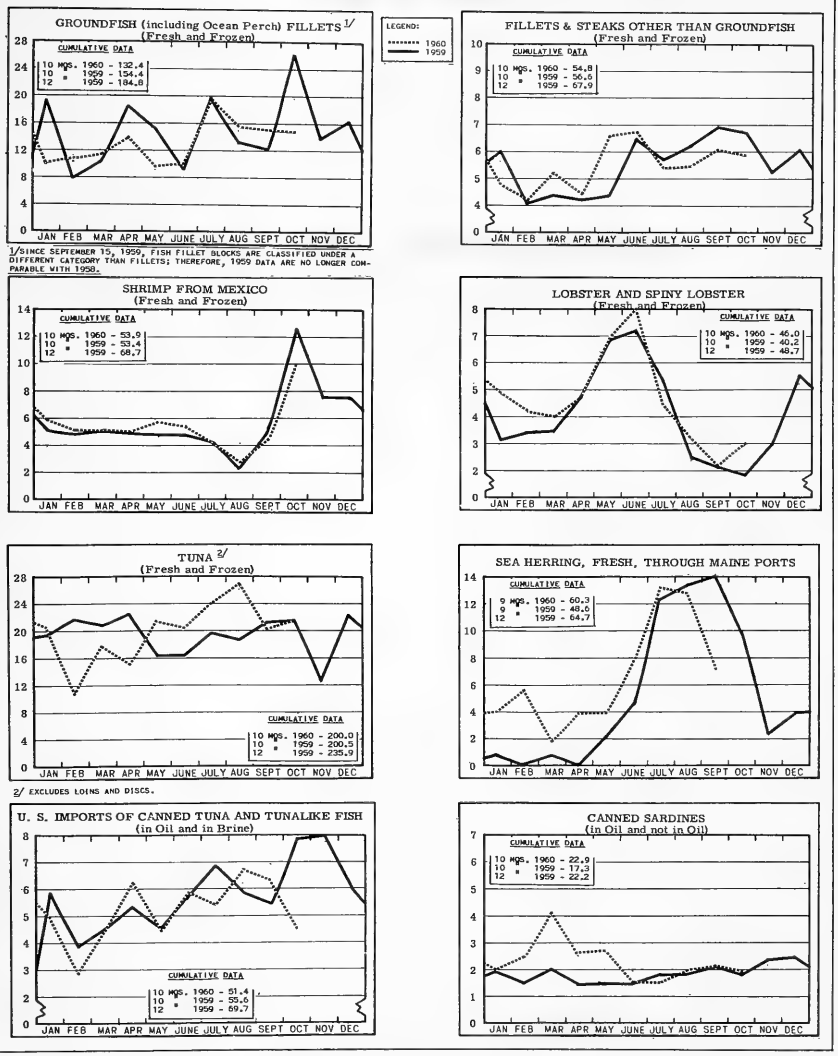


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds



1/ SINCE SEPTEMBER 15, 1959, FISH FILLET BLOCKS ARE CLASSIFIED UNDER A DIFFERENT CATEGORY THAN FILLETS; THEREFORE, 1959 DATA ARE NO LONGER COMPARABLE WITH 1958.

2/ EXCLUDES LOINS AND DISCS.

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
SL - BRANCH OF STATISTICS LIST OF DEALERS IN AN PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
SSR.- FISH. - SPECIAL SCIENTIFIC REPORTS- FISHERIES (LIMITED DISTRIBUTION).
SEP.- SEPARATES(REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number Title

CFS-2398 - Massachusetts Landings, July 1960, 5 pp.
CFS-2406 - Frozen Fish Report, September 1960, 8 pp.
CFS-2411 - Fish Meal and Oil, August 1960, 10 pp.
CFS-2412 - Louisiana Landings, April 1960, 2 pp.
CFS-2413 - New York Landings, August 1960, 4 pp.
CFS-2414 - Virginia Landings, August 1960, 3 pp.
CFS-2415 - New Jersey Landings, August 1960, 3 pp.
CFS-2416 - Rhode Island Landings, August 1960, 3 pp.
CFS-2417 - California Landings, June 1960, 4 pp.
CFS-2420 - Ohio Landings, August 1960, 2 pp.
CFS-2423 - Mississippi Landings, July 1960, 2 pp.
CFS-2429 - Fish Meal and Oil, September 1960, 2 pp.
CFS-2430 - Georgia Landings, September 1960, 2 pp.

FL-74 - (Revised September 1960) - The American Lobster, Homarus americanus, by Leslie W. Scattergood, 9 pp., illus. Discusses the classification of lobsters; their range and importance in the U. S. fisheries; attempts to transplant; their size, habits, and reproduction; and care of the eggs. Also covers the development of the young, growth and molting, enemies, method of holding and shipping lobsters, conservation measures, and production. Included is a list of publications on lobsters.

Wholesale Dealers in Fishery Products, 1959 (Revised):
SL-35 - Illinois (Mississippi River and Tributaries).
SL-47 - Louisiana (Mississippi River and Tributaries).

SSR-Fish. No. 345 - Physical, Chemical, and Biological Observations in the Eastern Tropical Pacific Ocean Scot Expedition, April-June 1958, by Robert W. Holmes and Maurice Blackburn, 109 pp., illus., 1960.

SSR-Fish. No. 348 - Marquesas Area Fishery and Environmental Data, January-March 1959, by Howard O. Yoshida, 41 pp., illus., June 1960.

SSR-Fish. No. 350 - Effect of Fishway Slope on Rate of Passage of Salmonids, by Joseph R. Gauley, 25 pp., illus., June 1960.

SSR-Fish. No. 351 - Creel Census Connecticut River Shad Sport Fishery, 1957-58, and Estimate of Catch, 1941-56, by Paul R. Nichols and Marlin E. Tagatz, 14 pp., illus., July 1960.

SSR-Fish. No. 352 - Parasites in Summer-Caught Pacific Rockfishes, by John Liston, John Peters, and Joseph A. Stern, 12 pp., illus., July 1960.

SSR-Fish. No. 353 - Use of Dynamite to Recover Tagged Salmon, by Richard W. Tyler, 11 pp., illus., July 1960.

SSR-Fish. No. 355 - Capturing Tagged Red Salmon with Pulsed Direct Current, by Richard B. Thompson, 12 pp., illus., August 1960.

SSR-Fish. No. 357 - Holding Ponds for Adult Salmon, by Roger E. Burrows, 15 pp., illus., July 1960.

SSR-Fish. No. 359 - Oceanographic Observations, 1959, East Coast of the United States, by C. Godfrey Day, 118 pp., illus., 1960.

SSR-Fish. No. 361 - Reference Sources for Marine Mammalogy, by Gerald J. Oppenheimer, 10 pp., August 1960.

Sep. No. 605 - Observations of Russia's Far Eastern Activities.

Sep. No. 606 - Down with Rejects--Up with Profits.

Sep. No. 607 - Equipment Note No. 6 - Chain Bridles and Accumulators Increase Effectiveness of "Fall River" Clam Dredges in Deep Water.

Sep. No. 608 - Equipment Note No. 7 - Space-Saving Chart Table Installed on Seattle Trawler Sunbeam.

Galveston Biological Laboratory Fishery Research, Circular 92, 79 pp., illus., July 1960. Summarizes the research work carried out at the Galveston Biological Laboratory during the fiscal year ended June 30, 1960. Describes in detail investigations on the shrimp fishery, the industrial fishery, estuarine ecology, red tide incursions, and effects on the fisheries of engineering projects in the Gulf area. Also includes special reports on penaeid shrimp, copper content of Tampa Bay waters, brown shrimp movements, and pink shrimp larvae. Of particular interest is work commenced on the effects of insecticides on a number of species of estuarine shrimp.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number	Title
MNL-36	Peruvian Fisheries Statistics, 1959.
MNL-37	Swedish Consumption of Fish and Fish Products in 1959.
MNL-38	Developments in Costa Rican Fisheries Industry, 1960.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE NOT FOR GENERAL DISTRIBUTION BUT ARE AVAILABLE FOR REFERENCE ONLY FROM THE U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3830, HONOLULU, HAWAII.

Critical Study of Echo-Sounders Used for Tuna Detection, by Fernando Lozano Cabo, 6 pp., processed. (Translated from F.A.O. General Fisheries Council for the Mediterranean, Proceedings and Technical Papers, vol. 5, 1959, pp. 91-99.)

The Use of Echo-Sounders in the Study of the Migrations of Tuna, by Fernando Lozano Cabo, 4 pp., processed. (Translated from F.A.O. General Fisheries Council for the Mediterranean, Proceedings and Technical Papers, vol. 5, 1959, pp. 101-104.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary - Fishery Products, June and July 1960, 8 pp. each. (Market News Service, U.S. Fish and Wildlife Service, 400 E. Lombard St., Baltimore 2, Md.) Receipts at Baltimore by species and by states and provinces for fresh- and salt-water fish and shellfish; total receipts by species and comparisons with previous years; and wholesale prices on the Baltimore market; for the months indicated.

California Fishery Market News Monthly Summary, Part I--Fishery Products Production and Market Data, September 1960, 16 pp. (Market News Service, U.S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish; mackerel, anchovies, and sardines; pack of canned tuna, mackerel, anchovies, and sardines; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; for the month indicated.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, October 1960, 13 pp. (Market News Service, U.S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and wholesale prices for fresh and frozen fishery products; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, October 1960, 4 pp. (Market News Service, U.S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

New England Fisheries--Monthly Summary, September 1960, 22 pp. (Market News Service, U.S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the principal New England fishery ports, and presents food fish landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the month indicated.

Production of Fishery Products in Selected Areas of Virginia, Maryland, and North Carolina, 1959 (As reported to Hampton Fishery Market News Office), by William N. Kelly, 44 pp., processed. (Available free from the Market News Service, 18 So. King St., Hampton, Va.) A summary of commercial landings of fish and shellfish and the production of crab meat and shucked oysters as reported by producers and wholesalers from selected principal fishing localities of Virginia, Maryland, and North Carolina. The statistics contained in this annual summary represent the approximate commercial fisheries production only and do not represent complete commercial landings or production for a given area, individual State, or the Chesapeake Bay area as a whole. However, the statistics give an indication as to the trend in fisheries production for the specific areas designated and reflect the over-all production trend by species, localities, and states.

Washington, Oregon, and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, October 1960, 11 pp. (Market News Service, U.S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria (Oreg.) wholesale dealers; also Northwest Pacific halibut landings; and Washington shrimp landings; for the month indicated.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ALEWIVES:

"Coming of the Alewives," by John Hay, article, Natural History, vol. 67, no. 5, May 1958, pp. 232-237, illus., printed. American Museum of Natural History, Central Park W. at 79th St., New York 24, N.Y. A description of a spring alewife run into streams on Cape Cod. Summarizes the life history of the alewife, its other common names, spawning, and high mortality of its eggs. Several excellent pen-and-ink illustrations are included.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

AUSTRALIA:

Manufacturing Industries, 1958-59. "No. 23--Meat and Fish Preserving," by S. R. Carver, 9 pp., processed. Commonwealth Bureau of Census and Statistics, Canberra, Australia, July 1960. Contains a summary of the principal statistics of Australian meat and fish-preserving plants during 1958-59, and comparisons with previous years. Includes data on the quantity and value of production and of foreign trade in canned and smoked fish, canned shellfish, fish paste, fish, meal, and other similar products.

BARENTS SEA:

Comparison of the Abundance of Year-Classes of Cod and Haddock in the Barents Sea, as Made from a Quantitative Survey of the Young Fish and from the Commercial Fishery, by A. S. Bananenkova, 17 pp., processed. (Translated from Trudy Poliarnovo N.-I. Institut Morskovo Rybnovo Khoziaistva i Okeanografii (PINRO), no. 10, 1957, pp. 54-77.) Fisheries Research Board of Canada, Biological Station, St. Andrews, N. B., Canada, 1959.

CANADA:

Canadian Atlantic Sea Shells, by E. L. Bousfield, illus., printed, C$1. Queen's Printer and Controller of Stationery, Ottawa, Canada.

Fish Culture Development (A Report of the Fish Culture Development Branch of the Conservation and Development Service), 45 pp., printed. (Reprinted from the Twenty-Eighth Annual Report of the Department of Fisheries of Canada.) The Queen's Printer and Controller of Stationery, Ottawa, Canada, 1959.

Fisheries Statistics of Canada (Nova Scotia), 1958, 53 pp., printed in French and English, C$1. Queen's Printer and Controller of Stationery, Ottawa, Canada, October 1960. Consists of tables giving the quantity and value of fish and shellfish landed in Nova Scotia, 1939-58; the quantity and value of fishery products by species and fisheries districts, 1957-1958; and capital equipment employed and number of persons engaged in the primary operations by fisheries districts, 1957-1958.

Journal of the Fisheries Research Board of Canada, vol. 17, no. 5, September 1960, 140 pp., illus., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada. Includes, among others, these articles: "On the Source of Free Ribose Formed Post Mortem in the Muscle of Lingcod (Ophiodon elongatus)," by Neil Tomlinson and Vera M. Creelman; "A History of the Lake Winnipeg Fishery for Whitefish, Coregonus clupeaformis, with Some Reference to Its Economics," by L. C. Hewson; "Maturity and Breeding of the Pacific Edible Crab, Cancer magister Dana," by T. H. Butler; "The Behaviour of Pacific Salmon Fry during Their Downstream Migration to Freshwater and Salt-water Nursery Areas," by J. McDonald; "Underwater Television Observations of the Swimming Speed and Behaviour of Captive Herring," by Vivien M. Brawn; "Seasonal and Diurnal Vertical Distribution of Herring (Clupea Harengus L.) in Passamquoddy Bay, N.B.," by Vivien M. Brawn; "Effects of Proposed Passamaquoddy Bay, N. B.," by Vivien M. Brawn; "Effects of Proposed Passamaquoddy Power Project on Anadromous Fishes in Canadian Waters," by C. J. Kerswill; "Temperature Tolerance of Unacclimated Herring (Clupea harengus L.)," by Vivien M. Brawn; "Survival of Herring (Clupea harengus L.) in Water of Low Salinity," by Vivien M. Brawn; and "Explorations for Herring in the Bay of Fundy and Gulf of Maine," by S. N. Tibbo and V. M. Brawn.

Thirteenth Annual Report of the Fisheries Prices Support Board, for the Year 1959-60, 9 pp., printed, 15 Canadian cents. The Queen's Printer and Controller of Stationery, Ottawa, Canada, 1960. In cooperation with the Economics Service of the Department of Fisheries, the staff of the Fisheries Prices Support Board continued to carry on surveys and other specialized studies of fishermen's costs and returns in Quebec and the Maritime Provinces. In addition, the staff, working in cooperation with the Department of Trade and Commerce, maintained a continuous review of the markets for various fishery products. This report also summarizes the Canadian fisheries during 1959; the fisheries markets; and Fisheries Prices Support Board activities such as fisheries salt assistance, Fishermen's Indemnity Plan, subsidy for destruction of Pacific Coast dogfish, and aid in construction of 20 community-processing facilities in Newfoundland.

CONTAINERS:

"The Sanitation of Fish Boxes. I--The Quantitative and Qualitative Bacteriology of Commercial Wooden Fish Boxes," by R. Spencer, article, Journal of Applied Bacteriology, vol. 22, April 1959, pp. 73-84, printed. Journal of Applied Bacteriology, Wallace & Tierman Ltd., Power Rd., London W4, England.

DENMARK:

Fiskeriberetning for Aret 1959 (The Ministry of Fisheries Annual Report for 1959), 146 pp., illus., printed in Danish with English summary. Fiskeriministeriet, 1 Kommission Hos G.E.C. Gad, Copenhagen, Denmark. A report on the Danish fishing industry during 1959. Includes information and statistical tables on the number of fishermen employed; fishing vessels; gear and nets; and landings of fish and shellfish. Also includes sections on trout produced in ponds; production of canned, smoked, and filleted fish; production of fish meal and oil; and foreign trade in fishery products.

EELS:

"Eels--An Export of Quebec," article, Trade News, vol. 13, no. 4, October 1960, pp. 8-9, illus., processed. Information and Educational Service, Department of Fisheries, Ottawa, Canada. The much maligned eel, a creature of murky waters shrouded in mystery is a practical reality to fishermen in Canada's Quebec Province as it bolsters their incomes by an annual sale of about a million pounds. This article discusses the spawning and food habits of the American eel and fishing gear used in Quebec.

ELECTRIC FISHES:

"Electric Fishes," by Harry Grundfest, article, Scientific American, vol. 203, no. 4, October 1960, pp. 115-124, illus., printed. Scientific American, Inc., 415 Madison Ave., New York 17, N. Y. The electric eel is only one of a number of fishes that are capable of generating a respectable electric current. These fishes variously use their electricity for purposes of attack, defense, and navigation.

EUROPEAN FISHERIES COMMUNITY:

"Let Us Have a Western European Fisheries Community." by John Bennett, article, World Fishing, vol.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

9, no. 11, November 1960, pp. 29-30, illus., printed. World Fishing, John Trundell Publishers) Ltd., St. Richard's House, Eversholt St., London NW1, England. The idea of a Western European Fisheries Community has been gaining ground lately. In this article, the author gives his views on the subject and sums up the many advantages which a community of this type would have for its members. Among the advantages would be the improved access to markets for all members and a coherent international policy of fisheries conservation.

FISH BEHAVIOR:
"Swimming Sounds and the Schooling of Fishes," by James M. Moulton, article, The Biological Bulletin, vol. 119, no. 2, October 1960, pp. 210-223, illus., printed. The Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass.

FISH BLOCKS:
Thawing of Blocks of Small Fish, by S. I. Gakicko and V. D. Borodin, 24 pp., illus., printed in Russian. Central Institute of Scientific Research of the Refrigeration Industry, A. I. Mikojana, State Editions of Commercial Books, Moscow, U.S.S.R., 1959.

FOOD AND AGRICULTURE ORGANIZATION:
Manual of Field Methods in Fisheries Biology (Provisional Edition), edited by G. L. Kesteven, FAO Manuals in Fisheries Science No. 1, 161 pp., illus., printed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1960. Contains sections on planning of expeditions (primarily sea-going); records and reports; collection and preservation of material; measurements and counts; gear and operating methods; and meteorological, oceanographical, and limnological observations. Emphasis is on fish measurement, physical oceanography, and commercial gear.

A New Method for "Aimed" One-Boat Trawling in Midwater and on the Bottom, by J. Scharfe, GFCM Studies and Reviews No. 13, 62 pp., illus., processed. General Fisheries Council for the Mediterranean Secretariat, Food and Agriculture Organization of the United Nations, Rome, Italy, September 1960. Design and operation of a new type of one-boat midwater trawl gear are described and discussed in detail. The construction of this gear, which can also be used on the bottom, resulted from experimental and developmental work conducted mainly in 1959 by the Institute for Fishing Methods and Gear Research, Hamburg, Germany. This trawl gear, which was found suitable for craft up to large deep-sea trawlers, combines special hydrofoil otter boards with a light and high-opening trawl net made of synthetic twine and an echo-sounding net gauge with the transducer attached to the headline of the net. The gear can be operated from conventional trawlers with only slight modifications in the usual handling. Intended primarily for midwater trawling, it can also be used successfully on a smooth bottom and close to rough ground. The next step, according to the author, is its use in exploratory fishing for previously unaccessible pelagic fish stocks.

The Food and Agriculture Organization has published a report describing that Agency's activities under the Expanded Technical Assistance Program for developing the fisheries of many countries. This report has not been published on a sales basis, but has been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Report to the Government of Turkey on Fish Handling and Refrigeration, by Helgi Bergs, FAO Report No. 282, 47 pp., illus., June 1954.

FREEZE-DRYING:
"Freeze-Drying, Dehydrofreezing Confused by Industry: Maclinn, article, Frosted Food Field, vol. 30, May 1960, p. 36, printed. Frosted Food Field, Inc., 19 W. 44th St., New York 18, N. Y.

FREEZING:
"Experiment on Oil Glazing, Especially Using Acetoglycerides," by K. Tanaka, article, Refrigeration, vol. 35, no. 389, March 1960, pp. 9-14, printed. Nihon Reito Kyokai (Japanese Society of Refrigeration), No. 3, 1-Chome, Ginza Nishi, Chuo-ku, Tokyo, Japan.

"Freezing and Thawing of Fish, article, Redogorelse for Arbetsaret July 1, 1958-June 30, 1959 (SIK Report No. 71), pp. 37-38, printed in Swedish. Svenska Institute For Konserveringsforskning, Goteborg, Sweden, 1959.

FROZEN FISH:
"The Storage of Frozen Salaka for Canning Purposes," by A. Piskarev, A. Kaminarskaja, and L. Luk'janica, article, Kholodil'naia Tekhnika, no. 2, 1960, pp. 40-43, illus., printed in Russian with English abstract. Kholodil'naia Tekhnika, c/o Four Continent Book Corp., 822 Broadway, New York 3, N. Y.

FUR SEALS:
"Canada's Share in the North Pacific Fur Seal Resource," by Gordon C. Pike, article, Trade News, vol. 13, no. 3, September 1960, pp. 8-9, illus., processed. Trade News, Information and Educational Service, Department of Fisheries, Ottawa, Canada. Discusses Canada's share in the profits (about $500,000 annually since 1940) of the fur-seal harvest conducted each year under supervision of the U. S. Bureau of Commercial Fisheries in the Pribilof Islands of Alaska. Also covers the provisions of the Interim Convention for the Conservation of North Pacific Fur Seals of 1957, under the terms of which this harvest is made. Canada and Japan each share 15 percent of the seal-skins taken commercially by the United States and the Soviet Union.

Sea Bears: The Story of the Fur Seal, by Fredericka Martin, 201 pp., illus., printed, $3.50. Chilton Co., 5605 Chestnut St., Philadelphia 39, Pa. About the Alaskan sea bears, the Aleuts who hunt them, and the fur trade.

GENERAL AGREEMENT ON TARIFFS AND TRADE:
The Activities of GATT 1959/60, GATT/1960-2, 35 pp., printed, 75 cents. International Document Service, Columbia University Press, 2960 Broadway, New York 27, N. Y., May 1960.

GERMANY:
"Struktur und Wirtschaftlichkeit der Kutterfischerei Schleswig-Holsteins" (Structure and Economic

Aspects of the Cutter Fishery of Schleswig-Holstein), by A. Pape, article, Informationsdienst der Landesregierung Schleswig-Holstein, vol. 8, no. 15, August 1960, pp. 107-110, printed in German. Informationsdienst der Landesregierung Schleswig-Holstein, Kiel, Germany.

HERRING:

"Det Norske Sildefiskets Naturgrunnlag" (Foundations of the Norwegian Herring Industry), by Finn Devold, article, Fiskets Gang, vol. 46, no. 36, September 8, 1960, pp. 506-512, illus., printed in Norwegian. Fiskets Gang, Postgiro nr. 691 81, Bergen, Norway.

"Norway's Herring Harvest," article, The Lamp, vol. 42, no. 3, Fall 1960, pp. 10-15, illus., printed. Standard Oil Company (New Jersey), 30 Rockefeller Plaza, New York 20, N. Y. A short description of the herring industry, highlighting one skipper and his village on the western Norwegian coast. Explains, in a simple, narrative, manner, the fleet, the varieties of herring and season fished, volume and value of the catch, the gear and method of landing the fish, herring byproducts, and division of the profits. The article also mentions the work of the Norwegian Government fishery research vessel, the importance of the herring industry in the economy, and fishing as a way of life for entire villages. The reproductions of dramatic full-color oil paintings of the fleet on the fishing grounds add a great deal of interest.

HONG KONG:

Hong Kong University Fisheries Journal, no. 2, September 1958, 147 pp., illus., printed, $2.20. Hong Kong University Press, Hong Kong, B. C. C. Contains, among others, these articles: "A Survey of the Biology of the Grass Carp, Ctenopharyngodon idellus (Cuvier and Valenciennes)," by J. L. Gidumal; "Growth Characteristics of Four Species of Pondfish in Hong Kong," by T. Chow; "An Analysis of the Fishing Operations of a Pair of Trawlers Based on Hong Kong from 1949 to 1952," by C. Y. Chu; "On the Biology and Culture of the Native Oyster of Deep Bay, Hong Kong, Crassostrea sp," by J. D. Bromhall; and "Report on the Fisheries Research Unit, University of Hong Kong, for the Years 1955 to 1957," by D. Barker.

_____, no. 3, April 1960, 201 pp., illus., printed, $3.15. Contains, among others, these articles: "Hong Kong Marine Fisheries Status Report No. 1 (1957)," by C. Y. Chu; "A Key to the Identification of Hong Kong Penaeid Prawns with Comments on Points of Systematic Interest," by T. S. Cheung; "Growth Characteristics of Two Species of Pondfish in Hong Kong," by T. Chow; "The Yellow Croaker Fishery of Hong Kong and Preliminary Notes on the Biology of Pseudosciaena crocea (Richardson)," by C. Y. Chu; and "Report on the Fisheries Research Unit, University of Hong Kong, for the Years 1958 to 1959," by F. D. Ommanney.

ICE:

"Preparation and Use of Antiseptic Ice for the Transport of Fresh Fish," by V. Bercescu and S. Cristea, article, Lucrarile Institutului de Cercetari Alimentare, vol. 3, 1959, pp. 249-260, illus., printed in Rumanian. Lucrarile Institutului de Cercetari Alimentare, Ministerul Industriei Alimentare, Institutul de Cercetari Alimentare, Str. Momdicevschi nr. 1, Bucharest, Rumania.

INDUSTRIAL OPERATIONS:

Pointers on In-Plant Trucking, by Wilbur G. Hudson, Technical Aids for Small Manufacturers No. 73, July-August 1960, 4 pp., illus., printed. Small Business Administration, Washington 25, D. C. Motorized trucks for in-plant materials handling are most economical in large plants in which the flow of work is intermittent and subject to change and when the size, shape, and composition of the materials to be transported vary considerably. Selection of the particular type of truck will depend on the uses to which it will be put and the power requirements. Ventilation for exhaust fumes is always a consideration in the use of fuel-burning engines in enclosed areas. Utilization of various types of pallets, portable platforms on which loads can be carried by lift trucks, can expedite materials handling operations. Cost factors in buying and operating mechanized equipment must be considered.

INTERNATIONAL CONFERENCES:

Participation of the United States Government in International Conferences, July 1, 1958-June 30, 1959, Department of State Publication 7012, 321 pp., printed, $1. Office of International Conferences, U. S. Department of State, Washington, D. C., September 1960. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Describes, among others, the following conferences: Eighth Session of the Indo-Pacific Fisheries Council of the Food and Agriculture Organization of the United Nations (Colombo, Ceylon, December 6-22, 1958); Fifth Annual Meeting of the International North Pacific Fisheries Commission (Tokyo, Japan, November 4-10, 1958); Interim Meeting of the Ad Hoc Committee on Abstention of the International North Pacific Fisheries Commission (Honolulu, Hawaii, August 7-11, 1958); Ninth Annual Meeting of the International Commission for the Northwest Atlantic Fisheries (Montreal, Canada, June 1-6, 1959); Second Meeting of the North Pacific Fur Seal Commission (Washington, D. C., December 8-13, 1958).

JAPAN:

Data Record of Oceanographic Observations and Exploratory Fishing, No. 4, 226 pp., illus., printed in Japanese and English. The Faculty of Fisheries, Hokkaido University, Hakodate, Hokkaido, Japan, March 1960. Consists of data collected on cruises to the Bering Sea and to the North Pacific and Okhotsk Sea during 1959. Data include information on plankton, fish larvae, salmon gill-netting, trawling, whales, and other material.

Data Record of Oceanographic Observations and Exploratory Fishing, No. 3, 303 pp., illus., printed in Japanese and English. The Faculty of Fisheries, Hokkaido University, Hakodate, Hokkaido, Japan, November 1959. Contains data collected on cruises to the northern North Pacific, north of New Guinea, the Bering Sea, and the North Pacific and the Okhotsk Sea during 1957 and 1958. Data include information on tuna long-lining, biological characters of salmon, hydrographic observations, and other material.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

The Tohoku Journal of Agricultural Research, vol. 11, no. 1, April 1960, 115 pp., illus., printed. The Faculty of Agriculture, Tohoku University, Sendai, Japan. Includes, among others, these articles: "Studies on the Utilization of Electro-Smokes-Solution for Fish Smoking," by Y. Tsuchiya and T. Nakano; and "Studies on the Amounts of the Anchovy Consumed by the Mackerel," by M. A. Hatanaka and M. Takahashi.

MINK RATIONS:

"Cod Fish Offal as a Complete Substitute for Horse Meat in Mink Rations During the Growth and Furring Seasons," by C. K. Gunn, article, National Fur News, vol. 32, no. 9, October 1960, pp. 36, 39, printed. National Fur News, Galen E. Broyles Co., Inc., 200 Clayton St., Denver 6, Colo. The scarcity and high cost of horse meat for mink feed has made it necessary for other kinds of food to be used. As cod offal is readily available in the Maritime Provinces, tests were carried out at the Experimental Fur Ranch, Summerside, Prince Edward Island, Canada, to determine its value. This article reports the quality and color of fur of mink that were fed cod offal.

NAMES OF FISH:

A List of Common and Scientific Names of Fishes from the United States and Canada (Second Edition), Special Publication No. 2, 104 pp., printed, $1 (paper). Secretary-Treasurer, American Fisheries Society, Box 483, McLean, Va., 1960. Includes 1,892 entries, more than a threefold increase over those in the first edition, presented as a natural or phyletic sequence of families of fishes, with the species of each family alphabetized to generic and specific names. In order to facilitate use, the three classes of recent fishes (jawless, cartilaginous, and bony) and the orders are indicated. Both common and technical names of families are given. An innovation in this edition is the inclusion of authorities for scientific names. Encompasses all species of fishes known from the fresh waters of the continental United States and Canada, and those marine species inhabiting contiguous waters on or above the continental shelf, to a depth of 100 fathoms.

NEW ZEALAND:

Report on Fisheries for 1959, 41 pp., printed. Marine Department, Wellington, New Zealand, 1960. A report on the fisheries of New Zealand which covers crayfish landings, fishing vessels and personnel, fish landings, methods of capture, landings at ports, exports and imports, big-game fishing, fish-liver oil, the 1959 whaling season, rock oysters, dredged oysters, the 1959 whitebait fishery, and landings of mussels. Also discusses fresh-water fisheries, and research, marine research, the Fishing Industry Advisory Council, and fisheries legislation. Includes statistical tables giving detailed data on the fisheries.

NORWAY:

"Forekomst av Egg og Yngel av Fisk i Vest- og Nord-Norske Kyst- og Bankfarvann våren 1959" (Fish Eggs and Young Fish off the West and North Norwegian Coast and Banks, Spring 1959), by Kr. Fr. Wiborg, article, Fiskets Gang, vol. 46, no. 37, September 15, 1960, pp. 522-528, illus., printed in Norwegian. Fiskets Gang, Postgiro nr. 691 81, Bergen, Norway.

OCEANOGRAPHY:

Oceanic Observations of the Pacific, 1950, 508 pp., illus., printed, $4.50. Scripps Institution of Oceanography, University of California, La Jolla, Calif. (For sale by the University of California Press, Berkeley, Calif.)

OEEC:

Marketing and Consumption of Frozen Fish in OEEC Countries, by Otto Hanssen, No. 21, Project No. 5718, 116 pp., processed, 7s. (about 98 U. S. cents). The European Productivity Agency, Organization for European Economic Cooperation, Paris, France. (Available from OEEC Mission, Publications Office, Suite 1223, 1346 Connecticut Ave., NW, Washington 25, D. C.) This report, presented at the meeting of experts on frozen foods held at Verona, October 6-12, 1959, surveys comprehensively the problems of grading, transport, and handling at retail of frozen fish and fillets in Europe. The first part of the report contains chapters on production, warehousing, transportation, wholesaling, retailing, and locker plants and home freezers. The second part covers problems in each of the member countries and discusses topics such as fish, landings, the fishing fleet, facilities for a cold chain, foreign trade in frozen fish, and promotion of the consumption of fishery products.

Summary Report on Activities Undertaken by EPA Since Its Establishment in 1953, 60 pp., processed. Division for Technical Action and Productivity in Agriculture and Food, European Productivity Agency, OEEC, 3, rue Andre-Pascal, Paris, 16e, France, May 1960. A report on the activities which form part of the work for a closer economic cooperation in Europe, launched by the Organization for European Economic Cooperation, of which the European Productivity Agency is the operational branch. A chapter on fish and fish products covers improvement of quality and packaging; organization and structure of the market for fish; improvement of methods of distribution and sales; market and consumer research; and development of the cold chain.

OREGON:

Salmon and Steelhead Hatcheries, 6 pp., illus., printed. The Fish Commission of Oregon, State Office Bldg., Portland, Oreg. A pamphlet describing briefly the operation of a hatchery; the history of the Oregon hatcheries; their purpose; natural salmon spawning; and the functions of the Oregon Fish Commission--the principal of which is the management and development of the State's food fish resources.

OYSTER FARMING:

"Use of the Escalator in Oyster Farming," by J. S. MacPhail, article, Trade News, vol. 13, no. 3, September 1960, pp. 5-7, illus., processed. Trade News, Information and Educational Service, Department of Fisheries, Ottawa, Canada. Although the escalator harvester was developed for fishing soft-shell clams, the author believes its greatest usefulness may be to the Canadian oyster farming industry. The new technique of rearing spat to bedding-size oysters on the bottom instead of on expensive floating trays and the ability of the escalator harvester to recover them will reduce the labor and material costs of oyster farming.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

OYSTERS:

"Conditioning Ostrea edulis L. from the Limfjord for Reproduction Out of Season," by I. A. Aboul-Ela, article, Meddelelser fra Danmarks Fiskeri- og Havundersogelser, Ny Serie, Bind II, Nr. 23-26, 1960, Nr. 25, 19 pp., illus., printed in English with Danish summary. C. A. Reitzels Forlag, Bianco Lunos Bogtrykkeri A/S, Copenhagen, Denmark, 1960.

"Mechanisms of Removal of Injected Microorganisms from the American Oyster, Crassostrea virginica (Gmelin)," by M. R. Tripp, The Biological Bulletin, vol. 119, no. 2, October 1960, pp. 273-282, illus., printed. The Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass.

PLANKTON:

Measuring the Production of Marine Phytoplankton, by J. D. H. Strickland, printed, C$2. Queen's Printer and Controller of Stationery, Ottawa, Canada.

POLLUTION:

Ecological Effects of Sewage Pollution in Biscayne Bay, Florida: Distribution of Coliform Bacteria, Chemical Nutrients, and Volumes of Zooplankton, by J. Kneeland McNulty, Ernest S. Reynolds, and Sigmund M. Miller, 14 pp., illus., printed. (Reprinted from the Transactions of the Second Seminar on Biological Problems in Water Pollution, April 20-24, 1959, U. S. Public Health Service, Robert A. Taft Sanitary Engineering Center, Cincinnati 26, Ohio.) U. S. Public Health Service, Department of Health, Education, and Welfare, Washington 25, D. C.

POND FISHERIES:

Hook-and-Line Catch in Fertilized and Unfertilized Ponds, by Donald F. Hansen and others, 50 pp., illus., printed. (Reprinted from Illinois Natural History Survey Bulletin, vol. 27, art. 5, August 1960, pp. 345-390.) Illinois Natural History Survey, Natural Resources Bldg., Urbana, Ill.

REFRIGERATED WAREHOUSES:

Capacity of Refrigerated Warehouses in the United States, October 1, 1959, Co St-2 (60), illus., processed. Agricultural Marketing Service, U. S. Department of Agriculture, Washington, D. C., October 1960. Knowledge of the capacity of refrigerated warehouses in the United States has been of interest to both industry and Government ever since 1921 when a survey was made to gather statistics on facility location, capacity, and type of service offered. Beginning with that initial effort, successive surveys were made, with one exception, on October 1 of each alternate year. They include all known public, private, and semiprivate refrigerated storage facilities, including one-product houses that include such products as fish.

SALMON:

Migratory Behavior of Adult Fraser River Sockeye, Progress Report by Philip Gilhousen, 81 pp., illus., processed. International Pacific Salmon Fisheries Commission, New Westminster, B. C., Canada, 1960.

SARDINES:

"Depuis Quand Peche-t-on la Sardine?" (How Long Has the Sardine Fishery Been in Existence?) by Jules Molard, article, France Peche, vol. 5, no. 43, September 1960, pp. 15-18, illus., printed in French with English summary. France Peche, 84 Rue Carnot, Lorient, France.

"Perspectiva Actual de la Pesca Espanola de Sardina" (Current Prospects for the Spanish Sardine Fishery), by V. Paz-Andrade, article, Industrias Pesqueras, vol. 34, no. 797, July 1960, pp. 266-267, printed in Spanish. Industrias Pesqueras, Policarpo Sanz, 21-22, Vigo, Spain.

The South African Pilchard (SARDINOPS OCELLATA) -- Trends in the Pilchard Fishery of the Union of South Africa, 1943-58, by C. G. Du Plessis, Investigational Report No. 38, 27 pp., illus., printed. (Reprinted from Commerce and Industry, September 1959). Division of Fisheries, Beach Road, Sea Point, Cape Town, Union of South Africa, 1959.

SPERM OIL:

"Methods of Analysis of Sperm Whale Oil and Its Derivatives," by S. A. Moldavskaya and E. S. Dmitrieva, article, Masloboino-Zhirovaya Promyshlennost, no. 7, 1955, pp. 30-32, printed in Russian. Izdatel'stvo Literatury po Pishchevoi, Promyshlennosti, Moscow, U.S.S.R.

Separation of Wax from Sperm Oil, by Katsumi Higashi, Iwao Kojiro, and Saburo Tsukamoto, Japan Patent No. 8531, September 24, 1958, printed in Japanese. Japanese Patent Office, Tokyo, Japan.

TENNESSEE VALLEY AUTHORITY:

Fish and Game Development, 1960, Report No. 235-60, 13 pp., illus., printed. Fish and Game Branch, Division of Forestry Relations, Tennessee Valley Authority, Norris, Tenn. Includes information and statistical tables on the commercial fish harvest in TVA reservoirs and mussel shell harvest in the Tennessee River.

TUNA:

"La Campana de Albacora y la Exportacion " (The Albacore Season and Exports), article, Industria Conservera, vol. 26, no. 253, July 1960, pp. 179-180, printed in Spanish. Industria Conservera, Calle Marques de Valladares, 41, Vigo, Spain.

"Problems of Colour of Frozen Tuna Meat on Cooking," by T. Yamamoto, Refrigeration, vol. 35, no. 389, March 1960, pp. 1-8, illus., printed. Nihon Reito Kyokai (Japanese Society of Refrigeration), No. 3, 1-Chome, Ginza Nishi, Chuo-ku, Tokyo, Japan.

"La Produccion de Tunidos--Nivel Actual de su Explotacion en Espana" (Tuna Production--Current Level of Spanish Exploitation), by Angel Gonzalez Rodal, article Industrias Pesqueras, vol. 34, no. 797, July 1960, pp. 271-273, illus., printed in Spanish. Industrias Pesqueras, Policarpo Sanz, 21-22, Vigo, Spain.

A Study of Measures of Population Density and of Concentration of Fishing Effort in the Fishery for Yellowfin Tuna, NEOTHUNNUS MACROPTERUS, in the Eastern Tropical Pacific Ocean, from 1951 to 1956, by Raymond C. Griffiths, 98 pp., illus., printed in Spanish and English. (Reprinted from Inter-American Tropical Tuna Commission Bulletin, vol. 4, no. 3, 1960, pp. 41-136.) Inter-American Tropical Tuna Commission, La Jolla, Calif.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Sugerencias para un Incremento de las Exportaciones de Atun a los Estados Unidos" (Suggestions for an Increase in Tuna Exports to the United States), article, Industria Conservera, vol. 26, no. 253, July 1960, pp. 185-186, printed in Spanish. Industria Conservera, Calle Marques de Valladares, 41, Vigo, Spain.

TURKEY:

Balik ve Balikcilik (Fish and Fishery), vol. 8, no. 9, September 1960, 32 pp., illus., printed in Turkish with English table of contents. Balik ve Balikcilik, Istanbul Balikcilik, Mudurlugu, Besiktas, Istanbul, Turkey. Includes, among others, these articles: "Food Poisoning and Sea Products (Part II)," by Orhan Demirhindi; "A Visit to Marmara Cold Storage Plant;" and "Protection Against Sharks."

UNION OF SOUTH AFRICA:

The South African Pilchard (SARDINOPS OCELLATA) and the Maasbanker (TRACHURUS TRACHURUS)--A Preliminary Study of the Salps and Doliolids Off the West and South Coasts of South Africa, by R. F. Van Zyl, Investigational Report No. 40, 29 pp., illus., printed. (Reprinted from Commerce and Industry, December 1959.) Division of Fisheries, Beach Road, Sea Point, Cape Town, Union of South Africa, 1960.

UNITED KINGDOM:

The Scottish Seine Net Fishery, 1921-1957, by A. Ritchie, Marine Research No. 3, 69 pp., illus., printed, £1 1s.(about US$2.95). Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland, 1960. Next to the otter trawl, the Danish seine-net is the most important type of gear in use today by Scottish fishermen for the landing of demersal fish. While trawling is limited to vessels based in a few ports, seining covers an extensive part of the Scottish coast and in many areas seining constitutes the main source of income to fishermen. This report covers regulations pertaining to the seine-net fishery; history of the fishery; and the species landed. Included are tables giving data on distribution of the various species landed by districts, months, and seasons during 1935-38, 1946-50, and 1951-55.

Sea Fisheries Statistical Tables, 1959, 40 pp., printed, 4s.(56 U. S. cents). Her Majesty's Stationery Office, York House, Kingsway, London WC2, England, 1960. Consists principally of statistical tables showing the quantity, total value, and average value of fish and shellfish production in England and Wales by species, region, and method of capture for 1959. Breakdowns of catches by vessels 40 feet and over, demersal landings, and pelagic landings are included. Information of the number of fishermen, vessels, and vessels by gross tonnage, principal ports and methods are given. Data on foreign trade in fishery products are also shown.

VENEZUELA:

"Laboratorio de Biologia Pesquera" (Fishery Biology Laboratory), by Felipe Martin Salazar, article, El Agricultor Venezolano, no. 24, no. 218, May-June 1960, pp. 18-21, illus., printed in Spanish. El Agricultor Venezolano, Ministerio de Agricultura y Cria, Caracas, Venezuela.

EFFECTS OF HIGH TEMPERATURE ON SURVIVAL OF THE GIANT SCALLOP

Scallops in the northern Gulf of St. Lawrence undergo mass mortalities that lead to sudden disappearances of local fisheries. A recent report by Dr. Lloyd Dickie of the St. Andrews Station and published in the Journal of the Fisheries Research Board (Volume 15, Number 6) suggests why. He shows first of all, in a series of critical tests, that scallops are killed by fairly warm water of 69° to 74°F. The exact temperature depends upon the previous temperature experience of the scallop, since those which are accustomed to warm conditions are more resistant to rapid warming. Sudden flooding of scallop beds by warm water may thus lead to mass mortalities. Such floodings have been observed to occur. Dr. Dickie points out that rapid changes in water temperatures can damage scallop populations in a second way. Scallops, unlike other shellfish, are ordinarily mobile and actually escape enemies. Sudden temperature changes such as are known to occur on the Magdalen Shallows, even if not killing, reduce scallop activity. When they are thus an easy prey to their enemies, populations can be greatly cut down by predation. (Bulletin, Fisheries Council of Canada - May 25, 1959.)

CORRECTION

The article entitled "Rapid Objective Freshness Test for Blue-Crab Meat and Observations on Spoilage Characteristics," which appeared in the November 1960 issue of Commercial Fisheries Review, pp. 12-15, had certain errors and omissions.

On p. 14, under the subheading RESULTS AND DISCUSSIONS, the second and fifth paragraphs should read:

"Colorimeter readings (turbidity values) and sensory evaluations for each lot of the crab meat processed by steaming are presented in figure 2; similar data for the crab meat processed by boiling are presented in figure 3. Actual values from duplicate samples agreed vary closely on any given day. This tendency was not observed in the earlier study on iced shrimp except when the shrimp were quite fresh. (See figures 2 and 3.)

Comparing figures 2a with 3a, 2b with 3b, and 2c with 3c indicates there was no consistent differences in the pattern of spoilage attributable to the type of processing utilized. The meat seemed to hold equally well whether the crabs were steamed or boiled."

The "Literature Cited" section omitted in the original article follows:

LITERATURE CITED

BENARDE, M. A.
1958. Observations on the Spoilage of Crab Meat. Journal of Milk and Food Technology, vol. 21, no. 11, pp. 318-321.

KURTZMAN, C. H., and SNYDER, D. G.
1960. The Picric Acid Turbidity Test--A Possible Practical Freshness Test for Iced Shrimp. Food Technology, vol. 14, no. 7, pp. 331-342.

Note: Authors express their appreciation to Bruce D. Rothrock for helping to conduct many of the chemical and sensory tests.

Figs. 2 and 3, which were also omitted in the original article, appear on the next page.

The corrected article in its entirety has been reprinted as Separate No. 603.

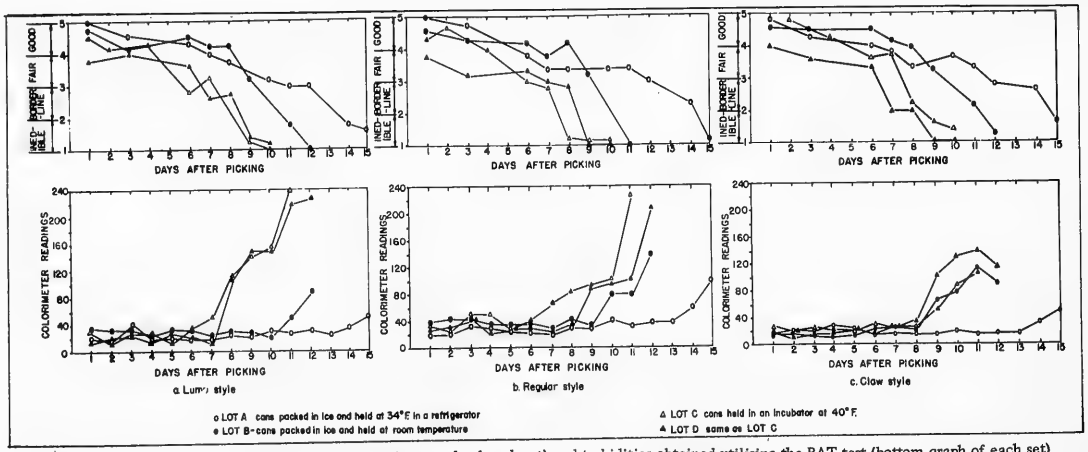


Fig. 2 - Comparisons of organoleptic evaluations (top graph of each set) and turbidities obtained utilizing the PAT test (bottom graph of each set) of crab meat held under various conditions of storage for each of three commercial styles processed by steaming.

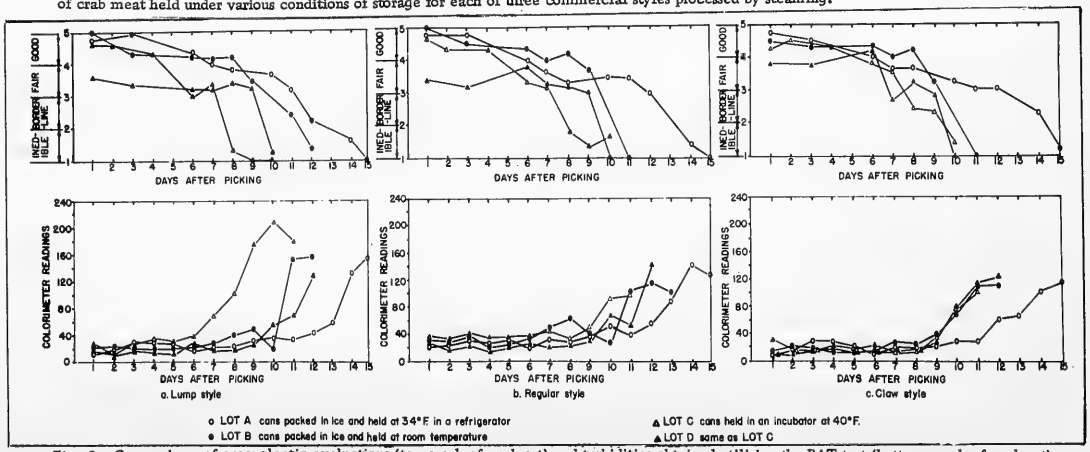


Fig. 3 - Comparisons of organoleptic evaluations (top graph of each set) and turbidities obtained utilizing the PAT test (bottom graph of each set) of crab meat held under various conditions of storage for each of three commercial styles processed by boiling.

FISHING BECOMES FAMILY HABIT ON ISLAND WITH 80,000 FISHPONDS

The lure of 80,000 fishponds plus well-stocked rivers and lakes is turning inland fishing on one of the world's largest islands largely into a family affair. The island is the République Malgache, formerly known as Madagascar. And getting the entire family to go fishing is part of the Government's search for ways to bring animal protein into the diets of its people.

Now entire families among the island population reach for fishing poles the first thing in the morning. Small tots sit solemnly next to their mothers, holding poles in their tiny hands, while the mother fishes with the family's newest addition strapped to her back. Other mothers take time out from fishing to nurse their children, but bait fish hooks while they do.

The whole project began, according to an FAO Fisheries Division expert, when the Government began introducing new species of fish, and promoting the use of fishponds.

Since 1950, the Government introduced 6 species of tilapia and in 1951 they brought in Tilapia melanopleura. This hardy, rapidly multiplying fish, found the rivers and lakes of Malgache to its liking and began multiplying.

The villagers now go to the lakes and rivers in the mornings and, on an average, catch 10 pounds of small fish per adult and about 4 pounds per child. Then they return to their village to eat the fresh fish and to smoke the fish they do not use.

On these lakes the villagers catch 44,000 pounds of fish yearly--18,000 pounds are consumed as fresh fish.

Along with stocking the lakes and rivers, the Government in 1954 hit upon the idea of digging fishponds in the central portion of the Island where there is an abundance of water. Government trained agents were sent out and taught the people how to dig ponds roughly 20 feet square in the clay soil. These ponds were stocked with tilapia, which when unfed develop into small numerous fish that provide protein but are not economically profitable.

The people took to the idea enthusiastically. By 1958, there were 40,000 fishponds (everywhere)--12,000, of them in a district where there were only 48,000 people. Today, there are 80,000 fishponds, stocked by Government fish farms, in Malgache.

The program of stocking fish, an excellent source of protein, in the rivers, lakes, and ponds, has added the much needed animal protein to the average Malgache diet of rice and manioc, a bit of fish and meat, some fruit, and a little honey. But this change has occurred only to the diet of those who happen to be near the sources of fish.

The fishermen on the coast or on the lakes now eat 7 ounces of fish a day--which more than favorably compares to the 5 ounces of fish eaten weekly by the European. Villagers, where fish markets are located, eat 22 pounds of fish a year, or average 1 ounce a day. But the people inhabiting the country's dry areas eat only about 7 pounds of fish a year, or about one-third ounce a day, and suffer from malnutrition. The fish is available, but the problem is to process it so that it can be distributed.

Malgache is one of the largest islands in the world. Like many former colonies, it outstrips its mother country in size; it is larger than France. Its geography ranges from a central jungle-covered mountain in the eastern part to large semi-arid bush areas in the south and western parts of the island. And scattered along the west coast of its coastline are the fishing villages, isolated from the inland towns by dense brush.